JUNE 27, 1955

STEEL
The Metalworking Weekly

Midyear Outlook

Better than anticipated

Metalworking executives expect upward trend will continue through second half — page 31

✔ **Spin Drawing Rolls Away Costs**
page 84

✔ **High-Strength Steels Gain Sales**
page 125

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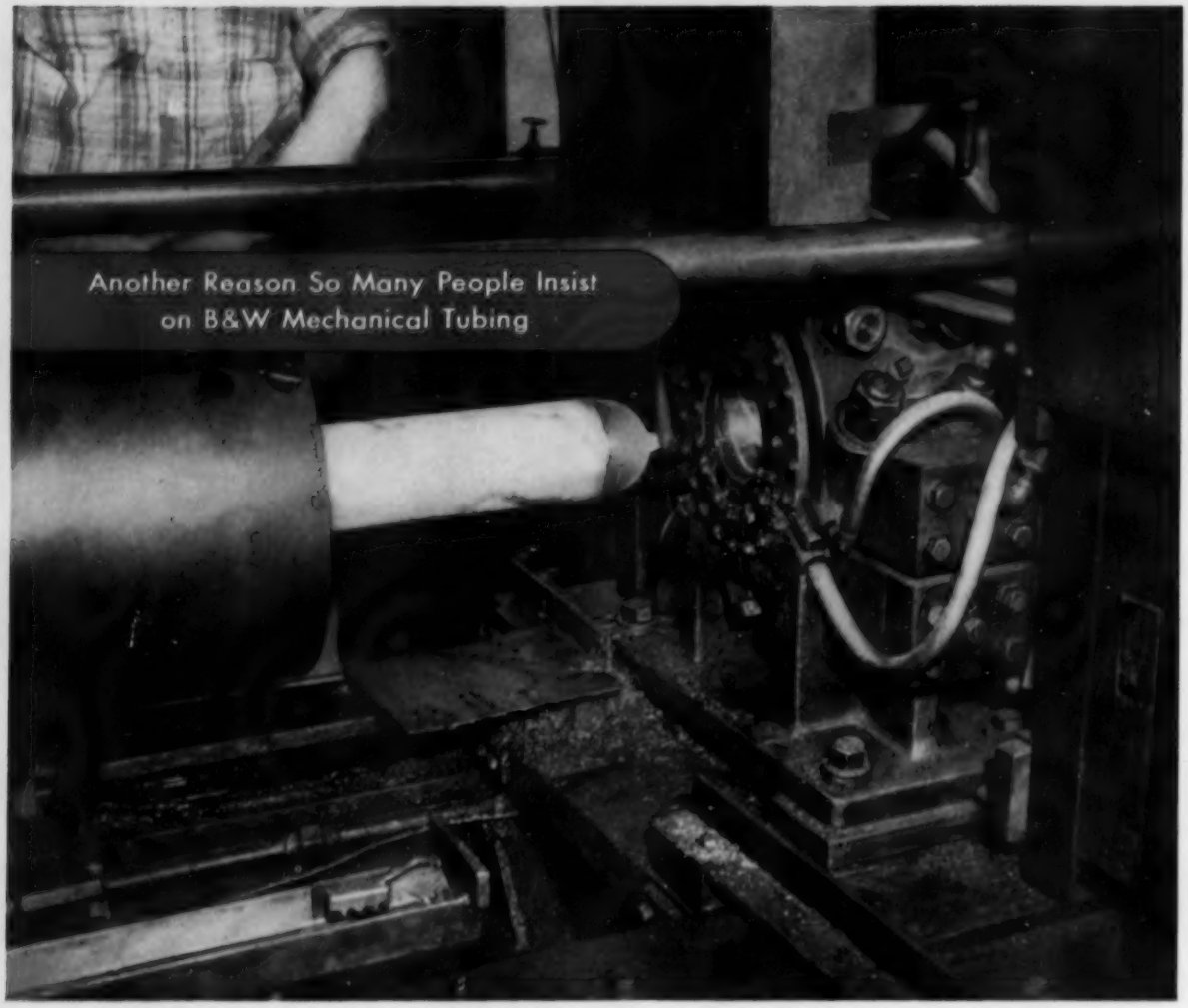


EVERYBODY WINS IN THIS GAME OF "SPIN THE BOTTLE"

Hoke, Inc., of Englewood, N. J., makes sampling bottles for the chemical process industries — to carry and contain a wide variety of fixed or liquefied gases, many of them highly corrosive. From the start of its operation in 1949, Hoke has insisted on B&W seamless stainless steel tubing, to be spun into bottles, in preference to competitive methods of deep-drawing or cold extrusion. Valves are attached at either or both ends.

The uniform wall thickness and concentricity characteristic of B&W stainless tubing contribute to the safety factor for which Hoke spun bottles are famous. Because Hoke uses short lengths of tubing, its quality control people have the advantage of 100 per cent inspection of the tubing stock used. Higher standards of cleanliness and safety are possible because of the uniform mechanical properties of the stainless tubing, and Hoke's automatic spinning operation (10 to 15-second production time cycle).

Whatever *your* requirements—carbon, alloy or stainless—you can do better with always-uniform B&W tubing. Get in touch with Mr. Tubes, *or write for Technical Bulletin 365 S.*

B&W
TUBULAR PRODUCTS DIVISION

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5006(M)

Sizzling steak on a steel wire grill

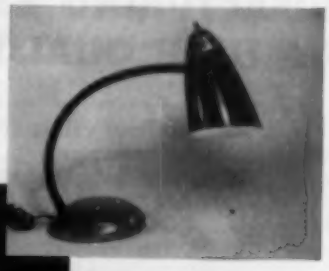
In making their line of braziers, small tables, lamps and other specialties, Keystone Lamp Manufacturing Corp. is using various types of Bethlehem wire, including bethanized wire, electrolytically coated with pure zinc by our unique process, low-carbon bright wire, high-carbon spring wire, and other grades.

Keystone is making braziers by the thousands at its Slatington, Pa., plant, trying to keep up with the growing demand. These portable grills have a 16-in. steel bowl which is removable for table-top use. Its slow, even heat is ideal for charcoaling a juicy steak to sizzling perfection. And the solid bottom keeps ashes from dropping out.

Whatever you need in steel wire, you can be pretty sure that Bethlehem makes it. In addition to the standard grades we specialize in producing single-purpose types, each tailormade for a given application.

Our metallurgists and salesmen will work with you all the way, both in selecting suitable grades of steel wire and in helping you to get the most out of them. Often we're able to come up with a suggestion that turns a problem into a profit for our customers. Just write to us at Bethlehem, Pa., or at our nearest sales office.

This popular model of "Bar-B-Bowl" has hinged legs for easy folding, a removable bowl and adjustable wire grill. Its slow, even heat charcoals a steak to perfection.



This attractive goose-neck desk light is one of many styles of lamps made by Keystone. Bethlehem wire of triangular section is used in making the goose neck.

The sturdy grill, welded from Bethlehem wire and nickel-plated, rests on wire legs and can be reversed for faster broiling. The bowl, legs, and other parts of the brazier are formed from Bethlehem cold-rolled strip.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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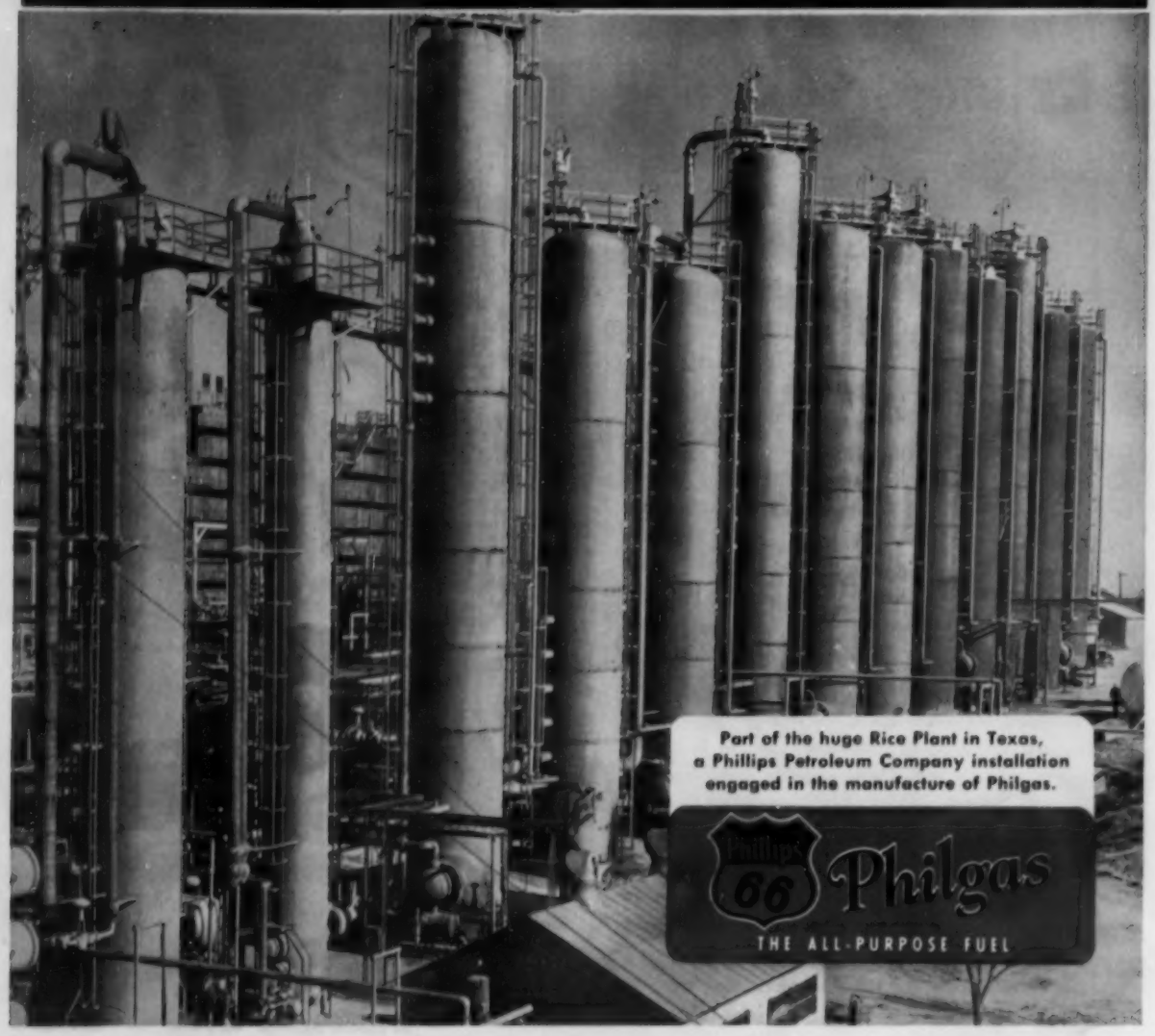
Part of the huge Rice Plant in Texas, a Phillips Petroleum Company installation engaged in the manufacture of Philgas.
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The HOBART 300 amp. electric drive DC welder has superior performance and true economy. It's designed especially for your average requirements in production, maintenance, repair, tool room work and general shop welding.

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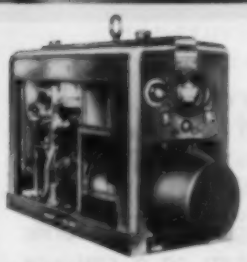
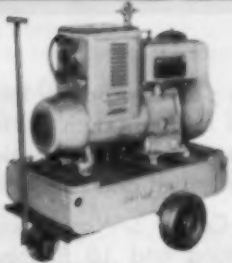
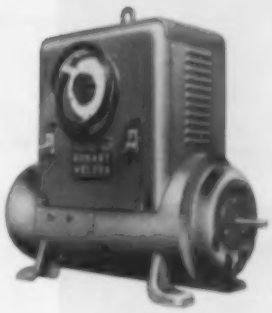


"Contractors Special" 250 amp. DC Welder. Designed for the profitable outside jobs. Lightweight, compact for handling and easy moving. It has a hot, fast, dependable arc and plenty of engine power.



"Husky Boy" 200 amp. Air-Cooled Welder. A low investment, lightweight air-cooled welder for general shop and outside repair work. It can be mounted on your pickup truck to quickly get to emergency repair work.



"Bantam Champ" 250 amp. Electric Drive Welder.

This modified multi-range type welder is a popular model in the light to medium 200 amp. class particularly where light weight and low cost are of prime consideration.

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Without obligation, please send me complete information on items checked below.

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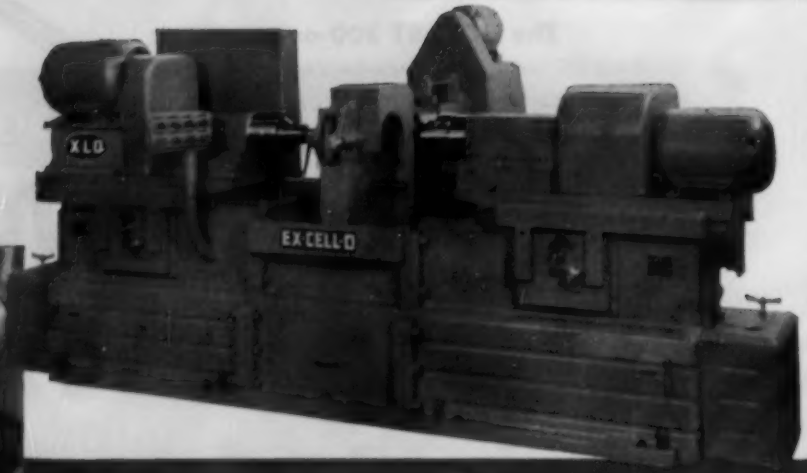
FIRM _____

ADDRESS _____

CITY _____ STATE _____

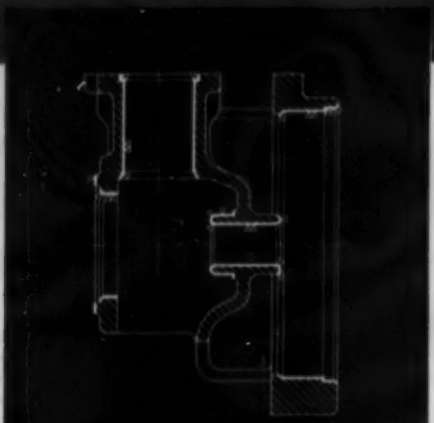
Ex-Cell-O 3-Way Precision Boring Machine. Standard way units—tooled to suit the work.

Note the simplicity of this tooling.



Cut Costs—Combine Operations

. . . INSURE YOUR PROFITS in Today's Competitive Market



Heavy lines show the machined surfaces. Small single triangles indicate single operations; double triangles indicate rough-and-finish operations.

Once a part is properly located and clamped, it's good practice to do as much machining on it as possible before it's moved! Related dimensions are held closer, handling time minimized and production increased.

This Ex-Cell-O 3-Way Precision Boring Machine performs 5 roughing and 18 finishing operations on a cast-iron crankcase used in the refrigeration industry. Tolerances are extremely close on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines—or write today for Bulletin.

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STEEL
The Metalworking Weekly

JUNE 27, 1955
Vol. 136 No. 26

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The Lord Baltimore HOTEL

behind the scenes

Scientific Forecasting

The art of divination has been practiced ever since men shed their tails and began wondering why they were men instead of angels. But whereas angels may prophesy at the drop of a feather and without the aid of professional equipment, men can't look into the future without helpful props. Over the years these aids have taken many forms: Charred bones, cooked entrails, dried excrement, crystal balls, tea leaves, playing cards, human hands, etc.

When Managing Editor Walt Campbell began working on his Midyear Metalworking Forecast (page 37), we had a sneaking curiosity about the type of prophesying props he might use. Would he rush about the country reading the palms of metalworking executives? Was he strictly a crystal ball man?

Rejecting standard props, he built his case on established figures and executive consensus. And as far as STEEL is concerned, brother, that ain't guesswork: It amounts to practically a sure thing. Since 1945, STEEL's Midyear Metalworking Forecast has been mighty close to being 100 per cent right. On several occasions it crossed up highly regarded economic experts. More than once, it has gone contrary to government expectations.

The Forecast is based on confidential letter interviews with a large cross section of metalworking executives, the theory being that active management knows more about its own business than an army of economic kibitzers. It does, too. So check that forecast, friend; it will bring you a heap of comfort if you're feelin' low.

Divers Labourers Diddled

Back in 1548 the king of England was 11 years old. Henry VIII had been dead for about a year, and diverse artificers, handicraftsmen and laborers went about shooting off their mouths about working conditions. But not for long. English law assembled in its full majesty, donned its collective wig and penned a statute that practically strangled the union movement before it had taken a breath. (Mixed figures always are so interesting, don't you think? Here we have a piece of parchment depriving a verb of air, yet the original thought is not too confusing.)

"Forasmuch," wrote the English lawmakers, glancing at the calendar to make sure it was still 1548, "as of late divers artificers, handicraftsmen and labourers have made confederacies and sworn mutual oaths not only that they should not meddle one with another's work, and finish that another hath begun, but also to appoint how much work they shall do in a day, and what hours they shall work, contrary to the statutes of the realm and to the hurt and impoverishment of the King's subjects; therefore, it is enacted that if anyone of them shall conspire, covenant, promise or make any oaths that they shall not do their work but at a certain price or rate, or shall not take upon them to finish that another hath begun, or shall do but a certain work in a day, or shall not work but at certain hours and times, on conviction every person so offending shall forfeit 10 pounds."

How about that? In 1548 10 pounds probably represented a year's wages. Conniving for a coffee break, coming in late, leaving early or hinting for a raise came pretty high in those days.

Lady of the Lake

When the octagon puzzle arrived at the White Motor Co., Cleveland, Director of Metallurgy Robert Abbott figured *more* triangles than 608, which is the answer. We hesitate to correct a guest, so to cover our confusion leave us turn to a lady, Miss Nora La Dow, Birmingham Tank Co., Birmingham, Ala., who sends in this:

Two men start walking toward each other at uniform speeds from two diametrically opposite points on the shore of a circular lake. They meet first at a point 1 mile from one of the starting points, and continuing, meet the second time at a point 1¼-miles from the other starting point. What is the diameter of the lake?

Shrdlu

(Metalworking Outlook—Page 31)

big things are happening in die making

big things are happening in die making

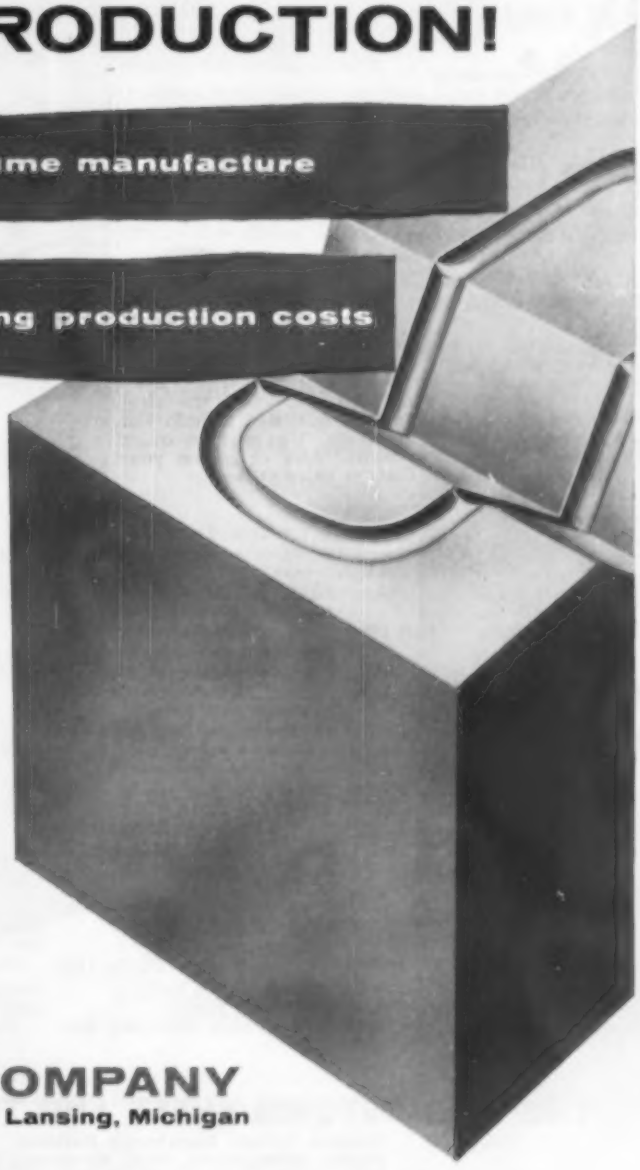
big things are happening in die making

big things are happening in die making

the big story in today's die making is VOLUME PRODUCTION!

die costs DROP with volume manufacture

new advances offset rising production costs



LOWER COST is the news in die making! Quantity production, through CUSTOM DIE's application of modern production methods to skilled die techniques, has introduced brand new manufacturing economies.

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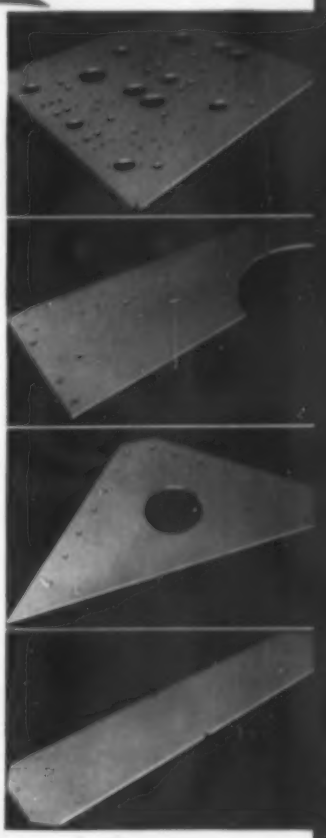

ELECTRONIC CHASSIS 12½" x 11½", with 118 holes and 4 notches was completed including setup in only 32.45 minutes and subsequent pieces in

6.44 minutes.

A part of FARM EQUIPMENT, 72½" x 22" with 32 holes and nibbled cut out was finished including setup in only 12.01 minutes, subsequent pieces in

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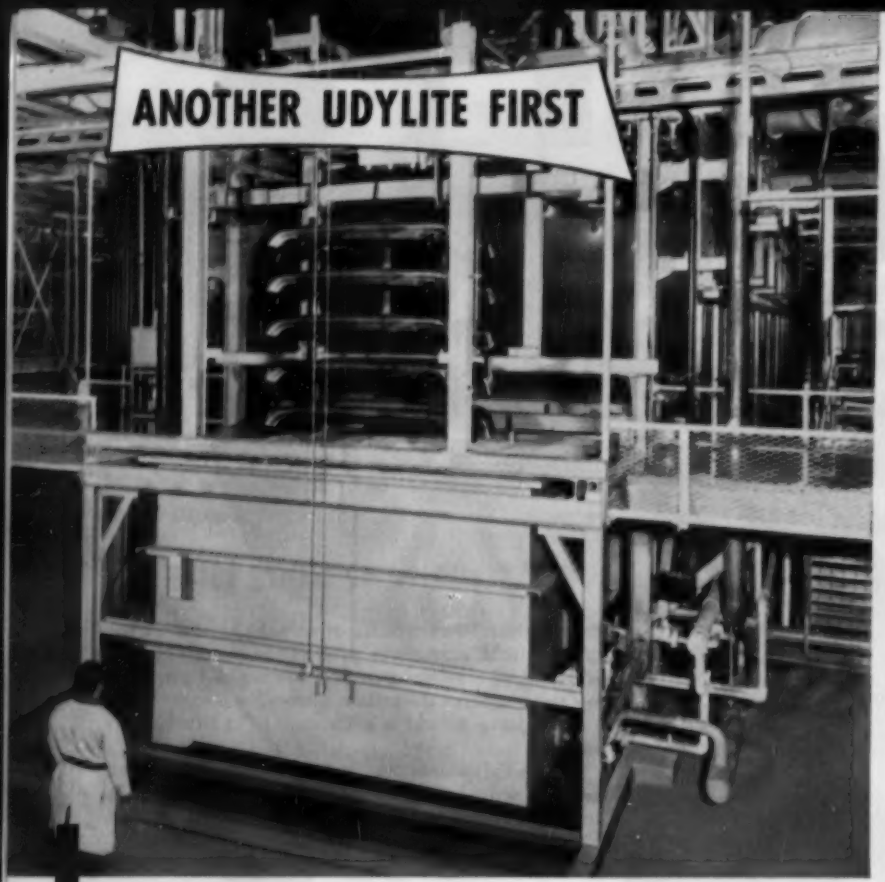

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Udylite builds plating and metal finishing machines large and small. The Udylite Full Automatic was the first standardized plating machine ever offered to the industry. It brought economy, high production and process control at a low installation price.

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LETTERS
TO THE EDITORS

Overemphasis Charged

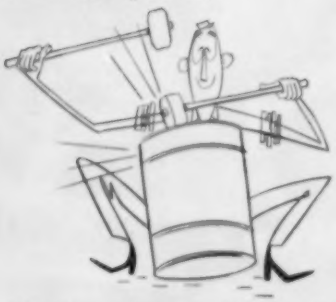
Whether or not you intended it as such, your article, "Resistance Welding May Be the Answer," (May 30, page 70), certainly presented an incomplete picture of resistance welding as employed in industry today.

The article might well have been prepared by Sciaky as publicity for 3-phase equipment, which they recommend for almost every application.

L. J. Gottschalk Jr.
Manufacturer's Representative
Chicago

• *Favorable comments on the story from users as well as builders of resistance welding equipment do not seem to bear out the contention that 3-phase welding was overemphasized. It was recommended as a possible solution to some troublesome power problems. We agree wholeheartedly that the greatest volume of production resistance welding is done with single-phase equipment.*

Drumming Up Sales



The June 6 issue carried an article on page 51 ("Used Drum Sales Jump 20%") telling about the increase in used drum sales. We would appreciate your furnishing us with names of companies that recondition used drums.

E. L. Dambrocia
Chief Clerk
National-U. S. Radiator Corp.
New Castle, Pa.

• *We are sending a list of companies doing this work. We will be glad to forward the list to interested readers on request.*

This article brings home the major points without undue "embroidery" to your readers.

It is gratifying to know that your publication looks toward the trade association representing an industry in order to obtain complete and unbiased information. We appreciate the privilege of co-operating with you.

Margaret A. Smith
Executive Secretary
National Barrel & Drum Association Inc.
Washington

Memo on Film

I read the article, "Business Communication" (May 16, page 103), with great interest and was particularly impressed to see how rapidly the interest in this problem is growing.

I suspect that our own activities in this

(Please turn to page 12)

When the Chips Are Down...

You Can Bet on SHARON to take the Gambling out of your STAINLESS STEEL Requirements

Type 430 Stainless and Galvanite* Coated booklets are available from any Sharon office.

Sharon produces all popular grades of Stainless Steel in large diameter coils for economical fabrication, and with the finest finish available in the industry.

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Sharon, Pennsylvania

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LETTERS

(Concluded from page 10)

field will continue to expand as our information becomes more complete.

We currently are working on what may turn out to be the first interoffice memo to be presented as a 16-mm color sound film. The matter appeared to have so great a potential importance to a client company that conventional methods of communication seemed inadequate. If this experiment works out, it may set a precedent for company messages of particular urgency or importance.

George Nelson
George Nelson & Associates
New York

Not Made Commercially

In the Technical Outlook column of May 30 (page 69), you have an item under the heading of "Tubing Defects" concerning a delayed shear-wave search unit as an effective ultrasonic means to spot internal defects in small diameter tubing.

I would appreciate information on the manufacturers of such devices.

W. W. McMinn
President
Helical Tube Corp.
Grand Rapids, Mich.

• *We know of no commercial devices. This item came from a paper entitled "Testing of Small Diameter Tubing with Automatic Recording Ultrasonic Equipment" by W. L. Fleischmann and H. A. F. Rocha of the General Electric Co. Write the American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y., for a copy of the paper (No. 55-S-23).*

GAW Exposition

Kindly send us three copies of the article, "GAW: A Toothless Dragon?" (June 13, page 66).

L. C. Dubs
President
Canton Stoker Corp.
Canton, O.

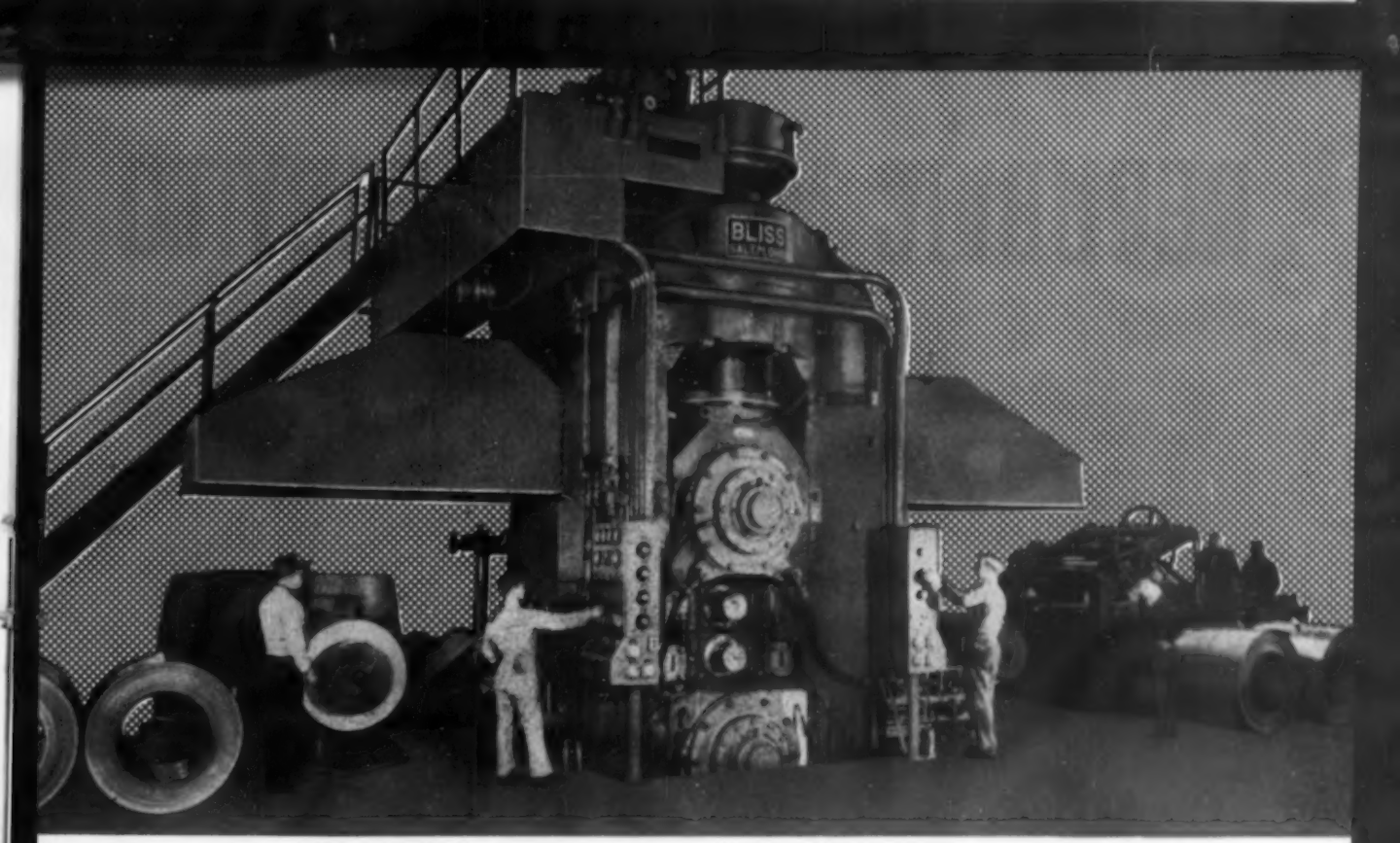
Word from India

Though I am only a recent subscriber of STEEL, I find instructive articles appearing in each issue—especially the articles on Heat Treating Tool Steels.

I feel that the nomograph for hardness conversion (Jan. 10, page 70) should be made out into a mechanical piece like a circular slide rule with a radial indicator. That way it can be used for daily reference in factories and the scales may be made of higher precision.

V. S. Kudva
Canara Workshops Ltd.
Mangalore, India

• *The nomograph has been made into a circular slide rule arrangement with a radial indicator. An announcement will be made as soon as they are available.*



Each minute...up to 1700 feet of cold rolled steel from

Newport Steel's New Bliss Cold Reversing Mill

This big Bliss mill has proved out "above expectation" in early test runs, and is now operating full time at Newport Steel Company's Newport, Kentucky, mill.

Working at speeds up to 1700 feet per minute, it reduces hot-rolled pickled strip in various gages and up to 48" widths. Its automatic coil handling equipment on both the entry and delivery end keeps pace with mill speeds, and is capable of handling coils up to 40,000 pounds.

Like all Bliss cold reversing mills, this Newport, Kentucky, installation is significant for its ease of operation. The mill is designed for fast changes, and centralized controls make possible virtually instantaneous adjustment while the mill is in operation.

This is just one of a complete line of Bliss rolling mills and accessories for both ferrous and nonferrous applications: two-high, four-high and cluster mills of Bliss manufacture are found in leading metal-producing plants throughout the world.

If you're interested in seeing how others have solved difficult cold and hot rolling problems, write for a copy of our recently revised Rolling Mill Brochure (Bulletin 40-A).

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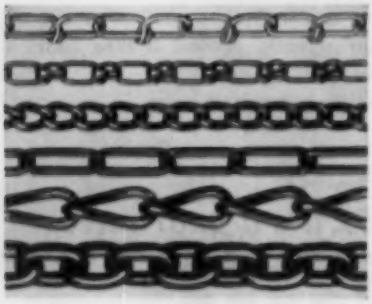

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Stainless Steel bulb for color television tube by I-T-E Circuit Breaker Co., Philadelphia, Pa.

Spinning Stainless Steel circles into cone.

Forming cone on 500-ton hydraulic press.

How Stainless Steel helps I-T-E put color into television

Television is opening up a whole, wide wonderful world of color and Stainless Steel is playing an important part in this great advancement. I-T-E Circuit Breaker Company is manufacturing the bulb assembly for color television using cones made from Stainless Steel.

The advantages lie in the light weight made possible by metal shell construction—a highly important consideration at this stage of color tube development—the safety factor of a metal-glass tube and the ability to use a higher-quality glass in the picture surface. Stainless Steel's coefficient of thermal expansion makes it a suitable material for a metal-glass bond.

I-T-E's choice of Stainless Type 430 for its color TV development was a natural as they have produced millions of Stainless Type 430 cones for black and white picture tubes ranging from 8½" diameter sizes to 27" rectangulars.

Stainless Steel's unique combination of properties merits consideration in all types of design problems. And it's not a difficult material to fabricate. Investigate Stainless Steel for your products, and when you do, be sure to use service-tested USS Stainless Steel.

SEE The United States Steel Hour.
It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

FABRICATING FACTS

For the bulb circles of USS Stainless Steel .125" thick are used. Circles are shear formed on a spinning lathe to produce a cone 21" in diameter, tapering to 8" by 14" deep.

Cone is further formed on 500-ton press. Panel is sheared from funnel, flanges are formed and deburred and both parts sandblasted to receive glass.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND
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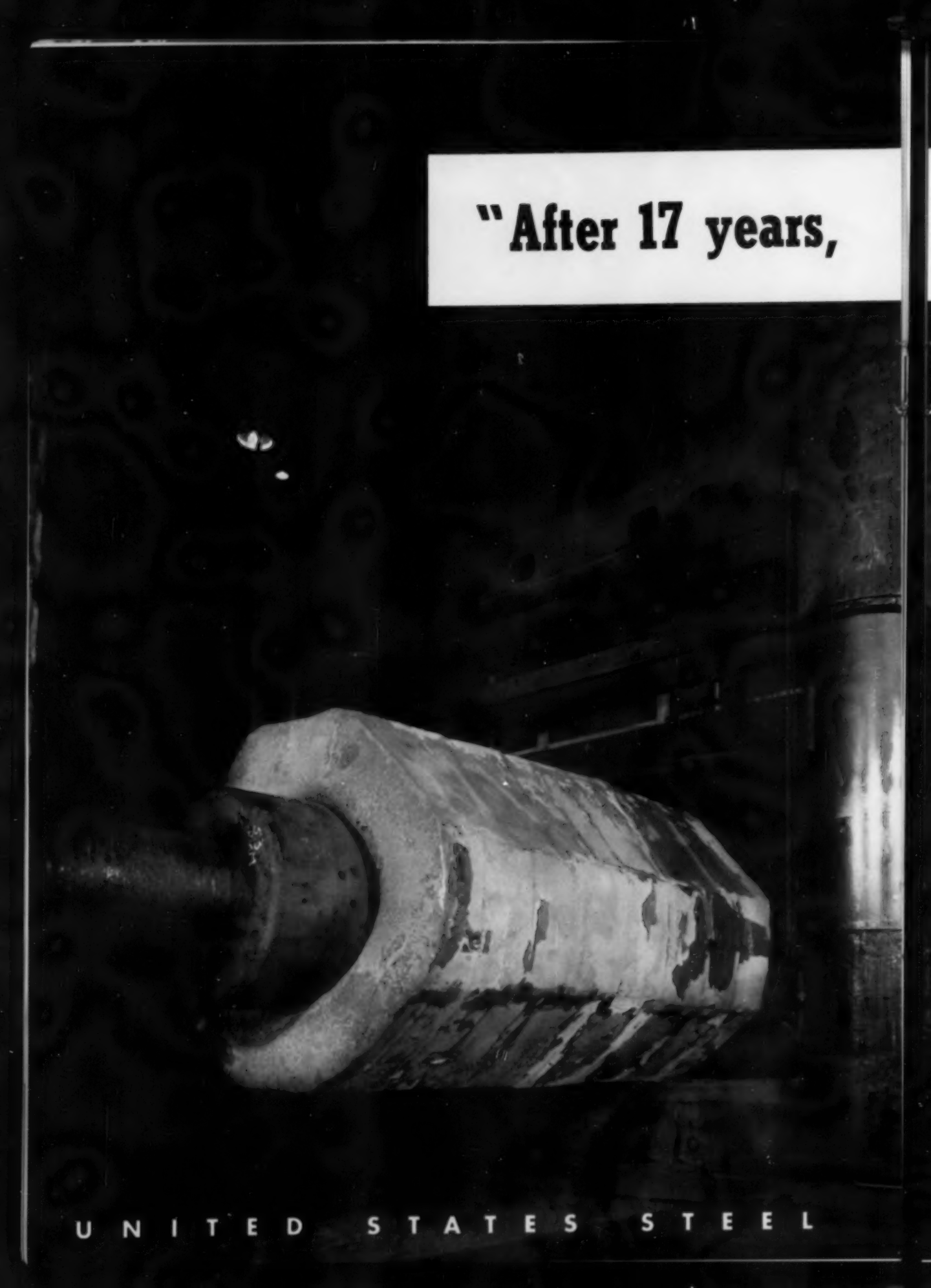

UNITED STATES STEEL

tough jobs like this become easy"

—says Jimmy Fenchak, U·S·STEEL PRESSMAN

● Jimmy has worked in our Homestead Forgings Division for 17 years--as crane floorman, press helper, craneman, press driver and manipulator operator.

Under his skillful care, the raw ingot gets its first and perhaps most important handling. Jimmy has to coordinate two cranes, a manipulator and the press itself to squeeze the rough ingot into a dense, tough piece of steel—accurately shaped to close dimensions.

That piece in the photo is a good example. It's going to be the main cylinder in an unusually large press of radical design. The press itself will be used for the relatively new method of cold-forming sheet metal over rubber dies.

But the most unusual feature of this forging is the fact that, after it is forged to size, we *squash* it into an oval shape. This shape is required because of unusual stress concentrations in the walls of the press cylinder. The cylinder forging, when completed, will be 14 feet long, 7 feet in diameter, 13 inches thick. It weighs 250,000 lbs.

The Pressman is all-important in a tricky job like this. The hole must be absolutely centered. The entire forging must be sound and free from flaws. And when the time comes to actually apply the big squeeze to form the oval, everything must be synchronized: ingot temperature, ingot position and the amount of pressure exerted by the press.

Fortunately, tough jobs like this are old stuff to U. S. Steel Pressmen like Jimmy Fenchak. Everybody in the crew knows that the job will come off without a hitch.

Our point is this: when you want a truly *quality* forging, you'll be wise to put the job in the hands of men like Jimmy. His skill, combined with the finest steel and machinery, is your best assurance of quality when you buy from United States Steel. For more information on U·S·S Quality Forgings, write to United States Steel, 525 William Penn Place, Room 4782, Pittsburgh 30, Pa.

USS

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- heavy machinery parts—carbon, alloy, stainless
- electrical and water wheel shafts
- hammer bases and columns
- marine forgings

EASY-TO-CAST REFRACTORY CONCRETE forms front wall of in-and-out billet and slab heater at Industrial Forge & Steel, Inc., Canton, Ohio. Refractory Concrete gives trouble-free service despite furnace-crown temperatures of 2200-2250°F.

Here's how Refractory Concrete cuts installation time . . . improves performance

THIS BILLET HEATER front wall is only one example of the ways that Refractory Concrete serves Industrial Forge & Steel, Inc., Canton, O. Refractory Concrete is used on hearths for in-and-out furnaces . . . on charging floor areas for open-hearth furnaces . . . to line billet furnace doors and pre-heating pits. Placed in 5 hours, a refractory concrete bridge wall for a coal-fired boiler gave better service than previous walls that took 2 days to install!

You'll find that Refractory Concrete made with Lumnite* calcium-aluminate cement gives trouble-free service wherever heat, corrosion or abrasion are problems. It's easy to place—by plastering, pouring or cement gun—and it's ready for use within 24 hours.

For added convenience you can use a Lumnite-base castable mix—Lumnite cement plus aggregates selected for specific temperature and insulation needs. All *you* do is add water, mix and place. Castables are made and distributed by leading manufacturers of refractories. For more information, write Lumnite Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, New York.

INTERIOR VIEW of heater. Refractory Concrete made with Lumnite reaches service strength within 24 hours . . . takes temperatures up to 2600°F. and more.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

**"LUMNITE" is the registered trade-mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

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represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

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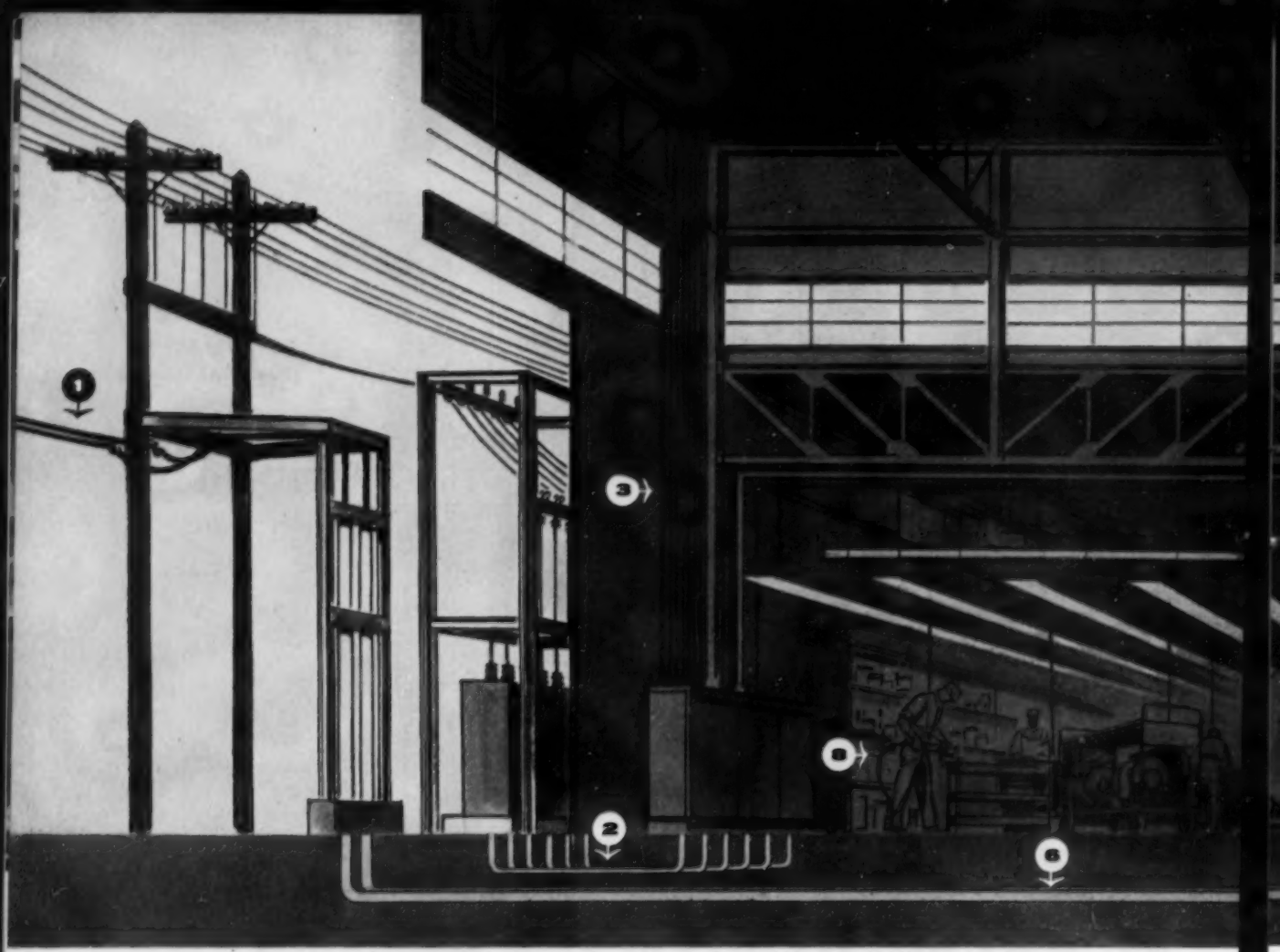
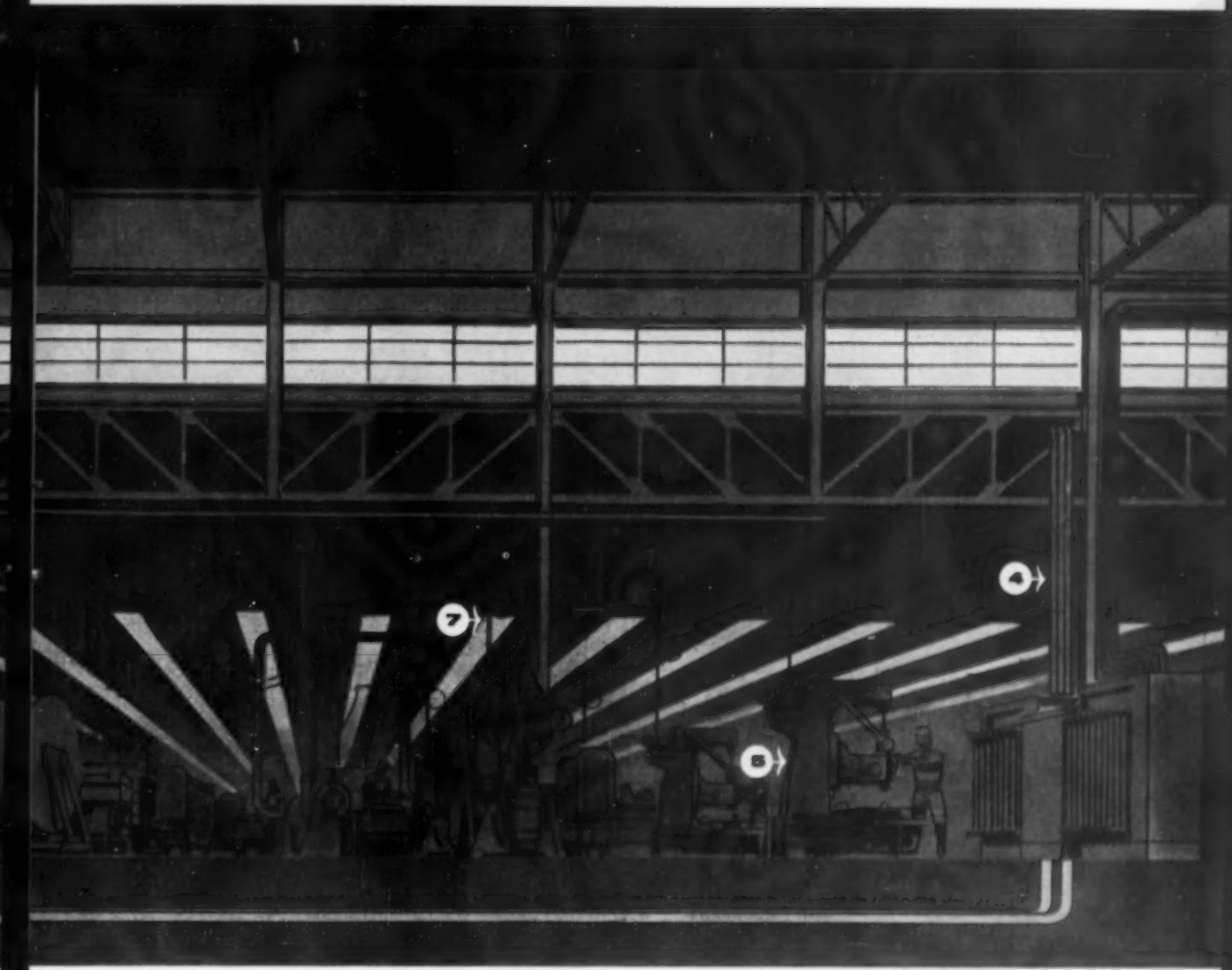


All around the plant, modern Anaconda wires and cables help industry reap the benefits of more efficient power, greater reliability, and long-range economy. Read on the following page the exciting facts about 1) new Aerial Cable, 2) new AHW moisture-resistant cable,

IT'S TIME TO TAKE A

Most manufacturers know inadequate plant wiring slows production and skyrockets costs.

But wiring can be adequate and still waste money—because it's obsolete! Here from Anaconda are the facts on what you can do to make your wiring as up-to-date as the rest of your operations.



3) rugged, corrosion-free Durasheath neoprene-jacketed cable used as feeders, 4) low-cost Interlocked Armor Cable, 5) new Control Cables, 6) ozone-resistant Butyl insulation for high-voltage cable, 7) Powerduct flexible busduct cable that increases the efficiency of busway systems, and 8) portable cords.

NEW LOOK AT WIRING!

Plant wiring today has become a major concern for management everywhere.

The reasons are easy to see. Shifting plant requirements, new tools, new materials, new handling procedures—*all* the great changes in modern industry are bringing with them special problems in power.

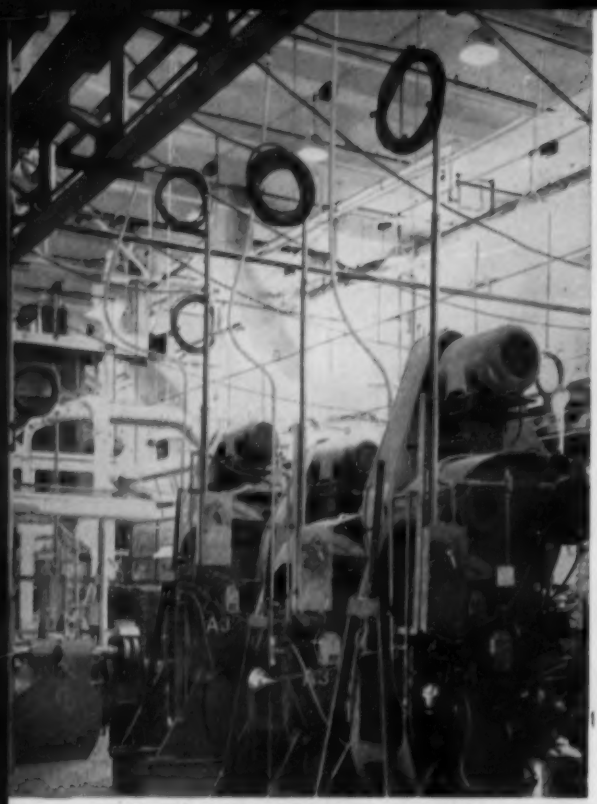
How these problems are solved has a direct bearing on your profit picture.

Since most plants were built – including some only a few years old—vast advancements in wires and power cables have taken place.

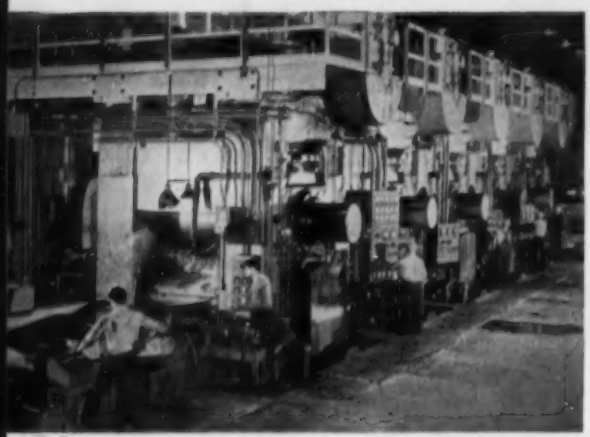
For example – new, thinner insulations today squeeze more capacity from existing conduit. New heat-resistant compounds boost wire current-carrying capacity. Tough new jacketing materials increase cable life. New cable designs enable manufacturers to find even more jobs for low-cost, efficient electric power.

Top management has a big stake in seeing that plant wiring is up-to-date. Though you must rely upon the knowledge and experience of qualified electrical experts when wiring up, acquaintance with modern industrial wires and cables will help you guide your company to sound decisions.

TURN THE PAGE AND SEE WHAT MODERN WIRING CAN DO FOR YOU



Metalworking plant eliminates expensive rewiring when equipment must be moved—by using *flexible* Anaconda **Powerduct Cable** from busduct to machine.



Steel Mill uses thousands of feet of Anaconda **Control Cable.** Modern insulations and jackets give most reliable service ever where there's heat and moisture.

IT'S TIME TO TAKE A NEW LOOK

7 ways modern costs down,

The nerve-system of your plant is its electric wires and cables. And now — with new production and operating factors in the picture — it's time for a basic survey. If they're obsolete, it will pay you to replace them . . . with new, more efficient, more economical ones.

Modern wiring has seen a wealth of new developments. Let's take a quick look at 7 of the most important of these *in light of changes that have probably taken place in your plant* since the original wiring was installed.

1. **NEW HIGHER VOLTAGES.** The trend to higher plant voltages — with its resulting savings in cable costs and line losses — poses a new problem: ozone, a by-product of high voltage, destroys ordinary insulation . . . and causes premature cable failure. Anaconda engineers have solved this problem with pioneering work in new *butyl* rubber. It has *inherent* resistance to ozone. Higher voltage (and ANACONDA butyl-insulated power cables) ought to come high on your list of cost-cutting ideas to talk over with your electrical department or contractor.
2. **NEW CABLE HAZARDS.** Chemicals, moisture, oil — natural to most modern plants — are tough on cable. Engineers at Anaconda have come up with an answer: Durasheath* rubber-insulated, neoprene-jacketed cable for all voltages. This rugged cable resists almost *every* enemy of cable life. Use it everywhere — aerially, in ducts, or buried directly in the ground — you'll find it reduces downtime, maintenance and replacement costs.
3. **NEW OPERATING CONDITIONS** put new demand upon wiring. Higher loads generate higher heat in cable . . . and more heat in cable installed underground or in other

Oil Refinery installed Anaconda self-supporting **Aerial Cable** for its low cost and ease of installation where underground structures made the job of burying cable difficult. Corrosion and electrolysis are eliminated.

AT WIRING!

wiring keeps production high

moist locations is tough on cable insulation. Today, AHW rubber insulation, used on many ANACONDA rubber power cables, does the best job ever in withstanding *heat and moisture together* at 80C operating temperature.

4. **NEW EQUIPMENT.** The addition of process-heating equipment, process or comfort air conditioning, or new production machines calls for more wiring to carry the load. ANACONDA Interlocked-Armor Cable can be installed up to 40% quicker than many other types of cable because it needs no conduit. You save time and money when the cable is installed – and later, too, if cable must be moved.

5. **MODERN BUSWAY SYSTEMS.** Today you can *increase* the flexibility of your busways – with Anaconda's flexible Powerduct* Cable. It just plugs into the busduct . . . and unplugs when you want to move machines. There's no costly conduit to put up or rip out. And the cable is 100% salvageable on every move!

6. **NEW POWER.** When additional power is needed, ANACONDA Aerial Cable is today's popular choice for the job, especially where the ground is packed with pipes and other structures or contains corrosive agents. It is fast, easy to install even between closely spaced buildings where clearance is limited. It's neat, safe, lower in cost than underground systems, and gives highest *reliability*.

7. **NEW ELECTRIC EQUIPMENT.** The trend to automation and more complex machines puts new emphasis on control cable. The job cannot be left up to cable whose performance is just "so-so." Anaconda's years of cable experience has paid off in a new full line of control cables – with modern types of insulations and coverings to give them highest reliability. These cables assure you the best possible service from your new equipment.

This advertisement provides only a few examples of how modern Anaconda wires and cables help industry wire up for more economical, more efficient production. Your electrical department or electrical contractor can give you personal and expert assistance with your needs.

*Reg. U. S. Pat. Off. 55514

see the man from

ANACONDA®

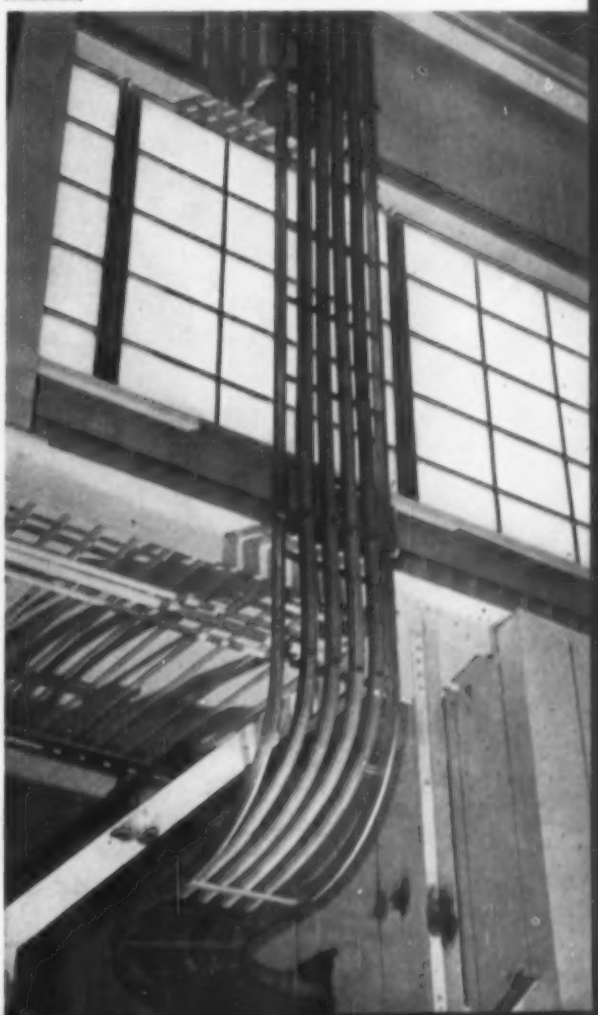
about your

POWER CABLES

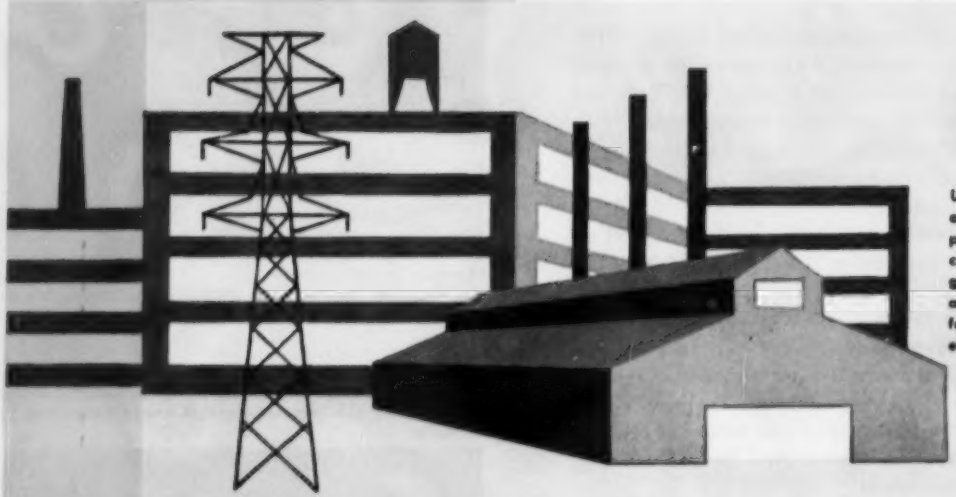
ANACONDA WIRE & CABLE COMPANY,
25 BROADWAY, NEW YORK 4, NEW YORK

Chemical plant installed thousands of feet of Anaconda **Durasheath Cable** for power and lighting. Rugged neoprene jacket resists heat, moisture, acids and alkalies.

Assembly plant reaped high-cost savings by installing flexible, quickly placed Anaconda **Interlocked-Armor Cable** from unit substation.



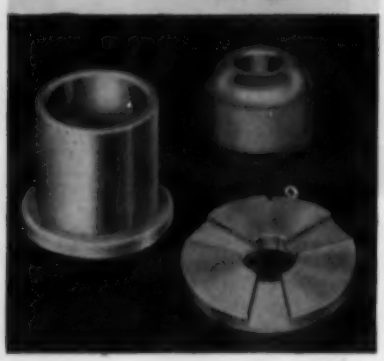
PRODUCTS that are improving the efficiency and speeding production in American industry



USG® Brushes are available in production or replacement lots in carbon, carbon-graphite, electrographitic, pure graphite and metalgraphite grades for all types of rotating electrical equipment.

GRAPHITAR® (carbon-graphite) is a versatile engineering material of carbon-graphite composition offered in many grades for bearings, seals, piston rings, pump vanes, thrust washers, valve seats, pistons, bushings.

Metallurgical graphite grades for carbon control in iron and steel melting, mold coatings, hot topping compounds, Cerdip®, Mexaloy® for refractory mixtures and other MEXICAN® products.



GRAMIX®: Sintered-metal bearings, gears, cams, slides, rollers, bushings and machine parts available in ferrous and non-ferrous alloys. The metal with the built-in lubrication.

206

OUR 101ST YEAR

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN

CALENDAR
OF MEETINGS

June 26-28, Alloy Casting Institute: Annual meeting, the Homestead, Hot Springs, Va. Institute's address: 32 Third Ave., Mineola, N. Y. Executive vice president: E. A. Schoefer.

June 26-July 1, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon hall, Atlantic City, N. J. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

June 27-29, American Nuclear Society: Annual meeting, Pennsylvania State University, State College, Pa. Information: Professor W. W. Miller, Pennsylvania State University.

June 27-July 1, American Institute of Electrical Engineers: Summer general meeting, New Ocean house, Swampscott, Mass. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

June 28-30, Steel Shipping Container Institute Inc.: Summer meeting, Hotel Pierre, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

July 12-14, Western Plant Maintenance Show: Pan-Pacific Auditorium, Los Angeles. Information: Clapp & Poliak Inc., 759 Monadnock Bldg., San Francisco 5, Calif.

July 21-23, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Sheraton-Cadillac hotel, Detroit. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Huise.

Aug. 15-17, Society of Automotive Engineers Inc.: West coast meeting, Multnomah hotel, Portland, Oreg. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Aug. 23-25, Stanford Research Institute and National Industrial Conference Board: Symposium on electronics in automatic production, Sheraton-Palace hotel, San Francisco. Information: National Industrial Conference Board, 247 Park Ave., New York 17, N. Y. Secretary: Herbert Briggs.

Aug. 24-26, West Coast Electronic Manufacturers Association: Western electronic show and convention, Civic auditorium, San Francisco. Information: WESCON, 344 N. LeBrea Ave., Los Angeles 36, Calif.

Aug. 28-Sept. 1, National Association of Furniture Manufacturers: Furniture supply fair, Conrad Hilton hotel, Chicago. Association's address: 666 Lake Shore Dr., Chicago 11, Ill. Secretary: John M. Snow.

Aug. 31-Sept. 20, World's Fair of Power: S. Lake Shore Dr. adjacent to Soldiers Field, Chicago. Sponsor: General Motors Corp., General Motors Bldg., Detroit 2, Mich.

Sept. 5-6, American Machine Tool Distributors Association: Annual meeting and show, Blackstone hotel, Chicago. Association's address: 1900 Arch St., Philadelphia, Pa. Secretary: Thomas A. Fernley Jr.

Sept. 6-8, Industrial Truck Association: Fall meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Sept. 6-8, Material Handling Institute Inc.: Fall meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

Sept. 6-17, Metalworking Machinery & Equipment Exposition: Coliseum, Chicago. Information: Exhibition & Convention Management Inc., 2080 E. Overlook Rd., Cleveland 6, O. General Manager: C. L. Wells.

Sept. 6-17, National Machine Tool Show: International Amphitheatre, Chicago. Sponsor: National Machine Tool Builders Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 9-11, Metal Powder Association: Fall closed meeting, the Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

NOW...

COLD-ROLLED SHEETS FROM

Newport Steel

Cold-rolled sheets are now being produced at Newport . . . our answer to a long-time demand by customers who find our hot-rolled products meet their most exacting requirements in quality, economy and service. These sheets are being rolled on a reversing cold mill just installed as part of our continuing program of expansion and modernization. Seventy years old in experience, new in facilities and methods, Newport is strategically located in the heart of the nation's greatest industrial growth—a dependable source for all the products listed here. You will profit by discussing your requirements with Newport before you buy more steel.

PRODUCTS OF NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Galvanized Sheets
Galvannealed Sheets
Colorbond Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Roofing and Siding
Eave Trough and Conductor Pipe
Culverts

ECONOMICAL WATERAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads and 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel CORPORATION
NEWPORT, KENTUCKY

YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF WHEELING-CHAPMAN & SCOTT CORPORATION

There's built-in durability in

WEIRKOTE

for all sheet-metal work

Wherever a durable zinc-coated material is needed for sheet metal fabrication, there's nothing better than Weirkote. Gutters, downspouts, ducts—no matter what the application, the name Weirkote on galvanized steel means uniformly high quality steel, tightly coated with zinc to resist cracking, peeling, flaking and corrosion. The high quality is assured by Weirton's modern mills and methods —and men.

When your specifications call for galvanized steel, call Weirton, and be sure.

Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.

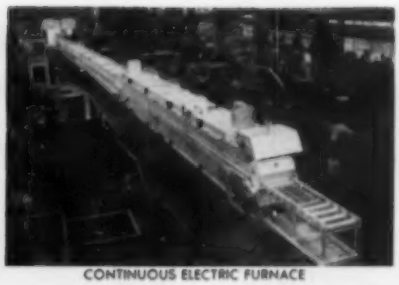
PITTSBURGH LOCK

WEIRTON STEEL COMPANY

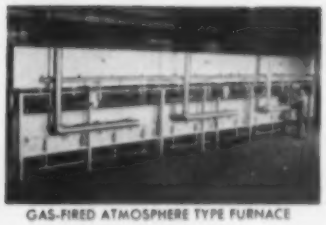
Weirton, West Virginia

NATIONAL STEEL CORPORATION

AUTOMATIC ROLLER GRID FURNACE

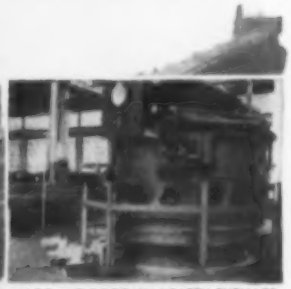


CONTINUOUS ELECTRIC FURNACE



GAS-FIRED ATMOSPHERE TYPE FURNACE

BIG ONES



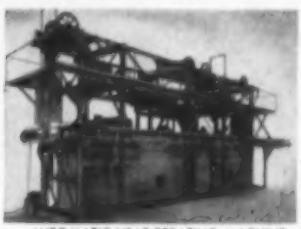
AUTOMATIC ROTARY HEARTH FURNACE

ALUMINUM BILLET HEATER

CONTINUOUS BRAZING PRODUCTION LINES

CONTINUOUS ROTARY RETORT FURNACE

CONTINUOUS CONVEYOR FURNACE



AUTOMATIC HEAT TREATING MACHINE

CONTINUOUS VITREOUS ENAMELING LINE

. . . all field-erected by Lindberg

Maybe you haven't heard the news. Lindberg is now set up to field-erect any type of industrial heating or processing installation. Here are just a few of the large field-erected installations already put up by Lindberg. More are being built right now.

You get a complete package deal from Lindberg. Expert engineers consult with you and analyze your needs. Then they plan and design an installation to meet your specific requirements, whether you need a single furnace or a complete production line. And Lindberg will build it for you, right in your own plant.

To get on-the-spot service from an expert Lindberg engineer, just call your nearest Lindberg Field Office (you'll find the number in the classified section of your phone book, or in the Trade Directories).

LINDBERG INDUSTRIAL

LINDBERG INDUSTRIAL CORPORATION

Chicago Plant: 2321 West Hubbard Street, Chicago, Illinois

Field Offices in principal cities

Los Angeles Plant: 11937 Regentview Avenue, at Downey, California

Associate Companies: Lindberg Engineering Company, Chicago • EFCO-Lindberg, Ltd., Montreal • Lindberg Italiana, Milan, Italy

Inconel makes "pipe dreams" come true

—*in the strangest places!*

Where are we? Looking up at the underbelly of a huge gasoline-powered tractor truck, just in from a long-haul run.

You'll be interested in that exhaust pipe overhead. But don't touch it! *It's red hot.*

Truck operators find most pipes a big source of trouble. When one "blows" on the highway, it means a delayed delivery . . . lost time for the driver...extra expense to the company.

Saving dollars. An ordinary exhaust pipe seldom lasts over 40,000 miles, and usually has to be replaced several times a year. Think what might be saved if a pipe *never* had to be replaced!

A pipe dream? Now it's a reality, thanks to the resourcefulness of a smart maintenance superintendent. Years ago, he started replacing worn-out carbon steel exhaust pipes with new ones made of Inconel®.

Crowding the million mark. Not a single Inconel pipe has ever been replaced. *Several have already logged almost a million miles each.*

Right now, you may have a metal problem of your own. It doesn't have to resemble this one. Inconel — possibly — is not *your* answer. But remember, there are more than 50 *other* Inco Nickel Alloys available. Find out whether one of them offers the means of transforming a cherished "pipe dream" of *yours* into a reality! Let's talk it over sometime soon.

Q. Where else is Inconel an outstanding success?

A. In jet planes — specifically in *flame tubes.* Here Inconel stubbornly maintains its strength even when white hot.

Q. Where would you be likely to *see* Inconel?

A. In a kitchen. Inconel sheathing is used on the surface heating units of most electric ranges. Inconel provides quick, even transmission of heat. It resists corrosion. It stands up under use — and abuse.

Q. Where can you find more information on Inconel and half a hundred *other* problem-solving Inco Nickel Alloys?

A. Write for our booklet, *Standard Alloys for Special Problems.* It's free to all who ask for it.

Nickel Alloys Perform Better Longer

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York 5, N. Y.

STEEL
June 27, 1955

Metalworking Outlook

Still Booming in 1956?

The current business boom will continue well into 1956, the U.S. Chamber of Commerce predicts. The chamber bases its forecast on the thriving construction industry, a steady increase in the money supply, general recovery of Europe, Latin America and Asia and "virtually full" employment in this country. The possibility of a continued slight drop in farm income this year and indications of labor unrest are cited as among the few soft spots in the economy. Prospects, as the chamber sees them, closely parallel those foreseen by the 7600 metalworking executives queried by STEEL (page 37).

Canada Recovers

Canada is pulling out of the mild recession of the last 18 months. The country's gross national output during the first quarter was on an annual basis of $25 billion, and economists predict a $26-billion rate by the end of the year. Exports, which have been 10 per cent higher than year-earlier figures, could come close to a record, based on the performance of the last six months.

Another Expansion for GM

General Motors Corp. will spend another $500 million to increase auto production capacity. The program will be substantially completed by the end of next year and will bring to $4 billion the amount GM will have spent in the U.S. and Canada for capital investment since the end of World War II. The new outlays are in addition to substantial expenditures for special tools during this period . . . Ford Motor Co. has launched a $100,000 industrial atomic power study. It will work on fuel elements—radioactive bars which make the atomic reactor perform. Ford will try to machine those bars so that they would be applicable for peacetime use.

Look at the Small Print

If your union is clamoring for a supplemental unemployment pay plan (SUP), don't buy the Ford formula lock, stock and barrel. It was tailored for Ford and contains some little-noted hedges. Sample: A credit unit system limits top payments to top seniority personnel; approval of the SUP fund hinges on U. S. acceptance of it as tax deductible; if the fund gets down to 4 per cent of its trust fund position, all payments stop; benefits also stop from layoffs necessitated by "acts of God," war or strikes at supplier or other Ford plants.

Industry-wide Auto Bargaining?

Don't expect much to come from the Ford proposal for industry-wide bargaining in the auto industry. Henry Ford II recommends that economic issues be bargained at the national level, with local plant problems left to

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individual parleys. Walter Reuther hastened to say that the UAW would never accept such a recommendation. He also "doubted" if industry would either. He's probably right about industry. The auto companies are so competitive in every way that they don't even like each other's methods of labor bargaining.

A 61-Cent Wage Cut

Workers at Eaton Mfg. Co.'s Vassar, Mich., foundry have accepted a 61-cent hourly wage cut to keep the facility open. Eaton's administrative vice president, Frank H. Mott, said he will recommend that the plant be reopened no later than Aug. 1. The wage situation previously had led to an Eaton decision to close the foundry. The cut will reduce average wages to $2.06 an hour from the previous $2.67. Eaton says that the average for foundry operations in the Vassar area is $2.05 an hour.

More Aluminum for Independents

Aluminum Co. of America promises that three times as much aluminum will be made available to independent fabricators in the third quarter as in the same 1954 period. Reynolds Metals Co. promises twice as much, and Kaiser Aluminum & Chemical Corp. states that "much more" will be offered (page 114). The statements were made before the House Small Business Subcommittee as a result of complaints that independent fabricators weren't getting a fair shake.

Question of Substitutes

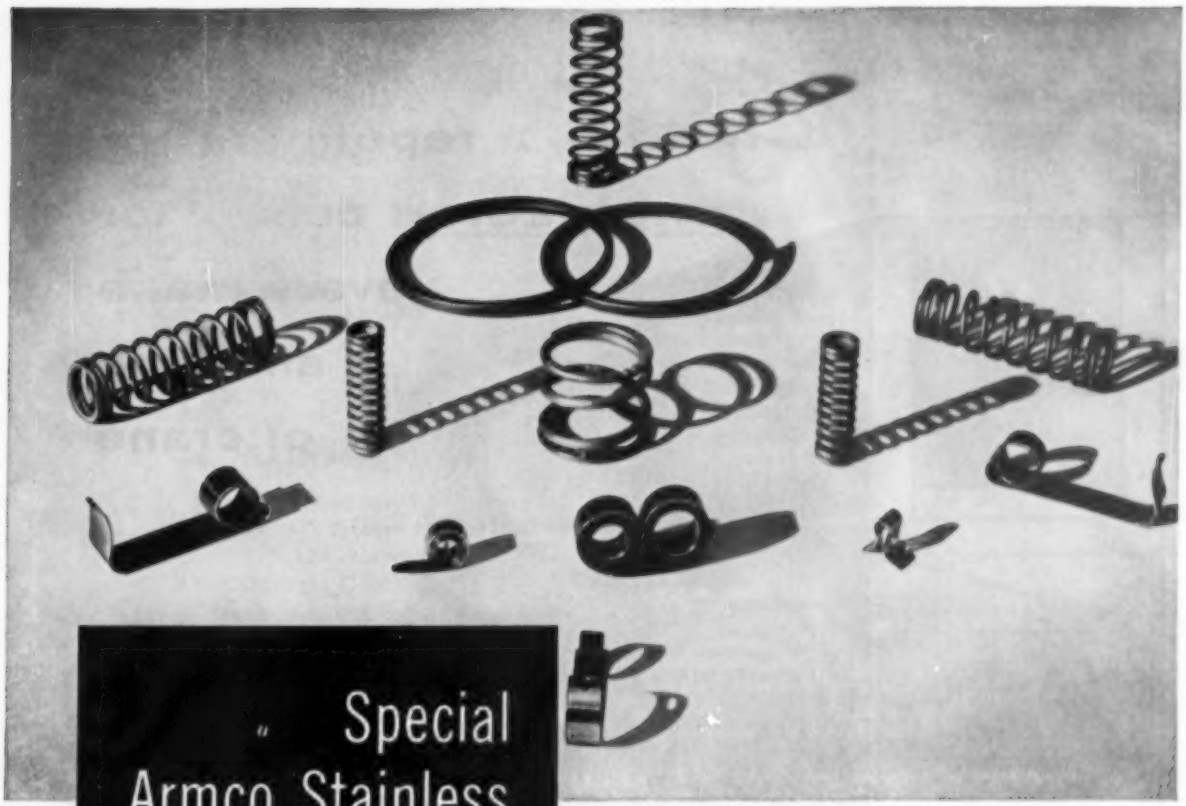
Look for Congress to try to spur more exploration and development to find substitutes for basic metals, fibers and chemicals that would be scarce in an emergency. Defense Mobilizer Arthur Flemming points out that we're still short of nickel, copper, cobalt, columbium and "certain fibers and chemicals."

More Money for B-52

The Senate's version of the $31.8-billion Defense department appropriation bill carries $356 million in new funds for the Air Force to step up production of the B-52 jet bomber. The debate on the measure also discloses the Air Force has recommended increased production of two supersonic fighters, the F-101 and F-104.

Straws in the Wind

U.S. Steel Corp. and Kaiser Steel Corp. are in a court battle over a "claim jumping" dispute concerning iron ore deposits in Riverside county, Calif. . . . Monarch Machine Tool Co. employees last week got wage increases of from 3 to 10 cents an hour to end a 10½-week strike . . . The U. S. is raising its estimate of construction this year to a record $41.8 billion—11 per cent above peak 1954 outlays of $37.6 billion.



Special Armco Stainless Spring Wire HAS STRENGTH OF MUSIC WIRE

A special Armco Stainless Steel, known as 17-7 PH, has proved far superior to 18-8 as a spring material. It is also better than non-ferrous spring wire in applications where higher strength is needed. Here are some of the characteristics of this grade of stainless steel.

High Load Capacity

Mechanical properties and modulus of elasticity of Armco 17-7 PH Stainless Steel wire are generally comparable to music wire. This means that the same spring capacity can be obtained in a corrosion and heat resistant spring as in a carbon steel spring, without increase in size.

High Elastic Limit

Armco 17-7 PH springs have a wide deflection range in which they are safe from permanent distortion. This is because of the high torsional elastic limit of the wire — 55 per cent of the ultimate tensile strength.

Better at Elevated Temperatures

Relaxation of helical compression springs of Armco 17-7 PH at temperatures up to 650 degrees F is considerably less than for 18-8 or music wire.

Torsional modulus of 11,000,000 psi is less affected at temperatures up to 650 degrees F than 18-8 or music wire.

Dimensional Stability

After fabrication, only a single heat treatment at 900 degrees F is required to develop full mechanical properties and this treatment stress-relieves as well. Spring dimensions are not affected by this hardening treatment because of the high dimensional stability of Armco 17-7 PH.

Armco 17-7 PH is supplied for coil or flat springs, in bars, sheets, strip and plates. A companion precipitation-hardening grade, Armco 17-4 PH, is supplied in bars.

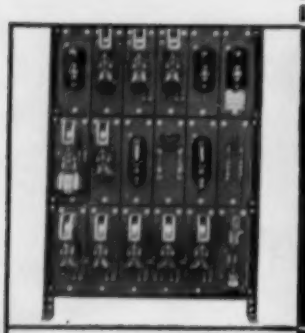
For further information, write us at the address below.

ARMCO STEEL CORPORATION

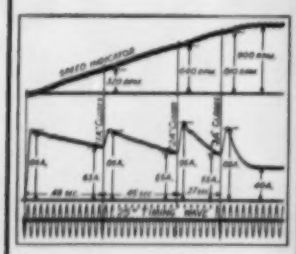
885 Curtis Street, Middletown, Ohio

Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

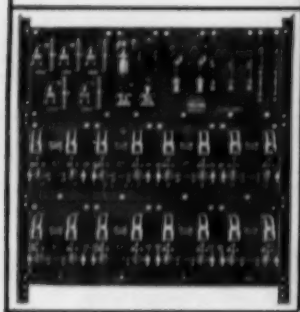
Earned... a reputation for **engineered** control for every make and type of crane



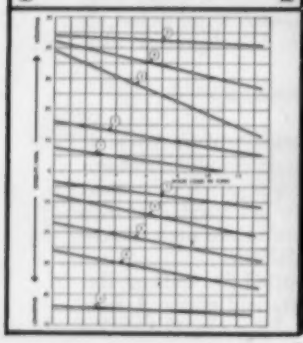
EC&M Wright Circuit Dynamic Lowering Controller is a simple, easily understood, completely safe system for D-c Cranes.



EC&M Frequency Relays accelerate A-c motors smoothly. They also accurately control plugging and speed-limiting functions.



EC&M Contra-torque Control for A-c Bucket Cranes improves operation with faster get-away . . . wider speed selection . . . smoother stopping.



EC&M Eddymag Hoist Control for A-c Cranes provides precise hook speeds for precision handling.

When crane control problems are tough, experienced crane users turn to **EC&M**. They know that the extra margin of safety and accurate engineering result in quick, efficient operation, lower upkeep costs and freedom from delays.

At **EC&M**, the control for every crane is "specific". The crane data sheet serves as the blueprint for matching control equipment to actual crane loading. Relay-settings . . . resistor fillings . . . contactor sizes . . . and brake windings are designed to assure top performance.

Make it a point to specify **EC&M** Control for your next crane.

6238

THE ELECTRIC CONTROLLER & MFG. CO.

4498 Lee Road • Cleveland 28, Ohio

High, but Competitive

Metalworking sales in 1955 should total a whopping $120 billion. Many believe 1956 will be even better.

That is the consensus of executives polled in this publication's Midyear Survey of Business Conditions.

More than half expect business will be better the last six months of this year than it was the first six. Seven in ten see a substantial improvement over 1954.

The inflationary bias will be resumed. Metalworking employment will expand modestly. Wages, costs and prices will edge upward. Expansion will continue. Profits, over-all, will be pretty good.

Other indicators of the metalworking business trend lend support to the bright prospect seen by STEEL's readers. The President's Council of Economic Advisors reports the economy is operating at its highest level in history. Industrial production advanced eight months in a row, and in May topped the previous peak reached in mid-1953. Manufacturing employment is increasing.

Construction estimates again are raised in a joint evaluation by the Commerce and Labor departments. Building is expected to total $14.8 billion, up 11 per cent from the record set last year.

The business outlook is bright. It exceeds expectations. But it should be viewed in proper perspective.

In tabulating the results of the latest survey, the editors became suspicious of the optimism. They double checked, looked for fallacies. Many questions were raised. None of the answers appeared to invalidate over-all results. Business is good and is getting better for a majority of companies.

But a fair-sized minority isn't faring so well. Fifteen per cent report business is going downhill. About as many expect 1955 will be a poorer year than 1954. Business failures are at a higher rate than in any year since 1941. What's wrong?

Some are affected by seasonal or cyclical influences over which they have little control. Some are enmeshed in fluctuating defense programs. Some segments of industry are being hurt by disastrous price cutting.

But most of the minority's trouble stems from a failure to recognize that today's high level economy is extremely competitive.

Products, methods, costs and distribution have to be updated if you are to share proportionately in the expanding economy.

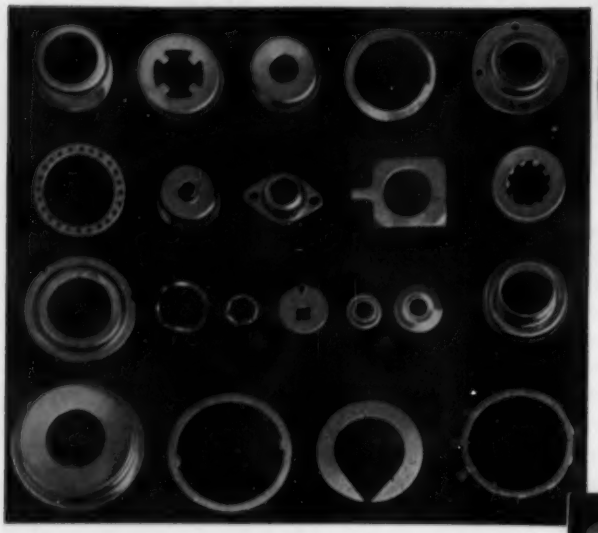
Walter J. Campbell

MANAGING EDITOR

LEADERSHIP *Backed by*
68 Years of Continuous Service to American Industry

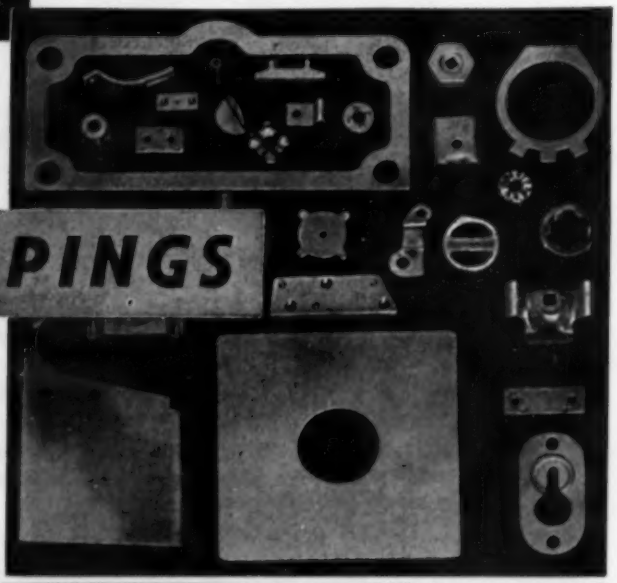
MILWAUKEE
WROT WASHERS

SINCE 1887



In terms of "satisfaction to the customer" the dominant leadership of Wrought Washer Mfg. Company in this specialized field represents not only a thoroughly dependable source of supply to meet all your requirements for Standard and Special Washers, but of equal importance, it carries with it a wealth of technical know-how dealing with a wide variety of production and design problems . . . available to you as a gratis service. More than 25,000 sets of dies "in stock" at our plant offer the greatest range of selectivity.

Our equipment for handling contract production of stampings includes presses for blanking, forming, drawing, shearing and extruding. In many cases it is possible to produce stampings at a lower cost than they can be produced in your own plant, with our own equipment. Our own tool and die-making shop enables us to make up the necessary tools to fit your specifications.



STAMPINGS

We are equipped to furnish stampings in any desired materials and finishes, ranging in size from small parts to large heavy-gauge pieces. Our engineering staff will be glad to co-operate with you in every way consistent with economical and efficient production.

• • •

Send us your blueprints for quotations on special washers and stampings made to your individual specifications. Write for copy of 76-page Catalog "30" with tool list and complete round washer specifications.

WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

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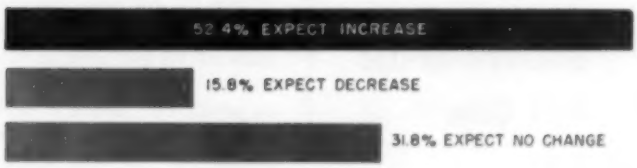
Industry Heads for $120-Billion Year

- Second Half Volume Will Rise
- Employment Will Increase
- Selling Prices Edge Upward
- Manufacturing Costs Climb
- Capacity Continues To Expand
- More New Products Coming

Second Half Volume Will Increase 2%



• OF THOSE EXPECTING INCREASE

5.1% expect it will be less than 2½%
27.5% expect it will be 2½%-7½%
36.0% expect it will be 7½%-12½%
13.3% expect it will be 12½%-17½%
18.1% expect it will be more than 17½%

• OF THOSE EXPECTING DECREASE

6.7% expect it will be less than 2½%
26.6% expect it will be 2½%-7½%
29.9% expect it will be 7½%-12½%
16.6% expect it will be 12½%-17½%
20.2% expect it will be more than 17½%

THE FAST PACE set by the metalworking industry in the first six months will be accelerated in the second half.

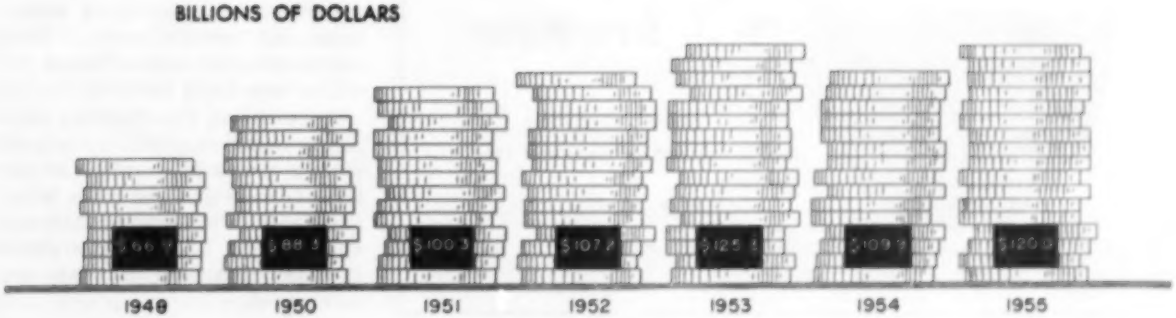
Despite shutdowns for vacations and other seasonal influences, metalworking sales for the next six months will gain 2 per cent.

Total metalworking sales for the year will be $120 billion, up 9.1 per cent from 1954, and only 4 per cent below 1953's.

Prospects for 1956 are even brighter.

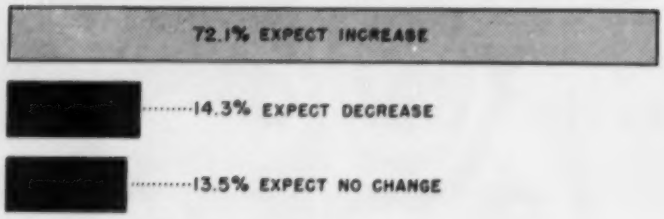
That is the consensus of metalworking executives replying to STEEL's Midyear Business Conditions questionnaire. The editors, believing the men who manage the country's metalworking plants are the best judges of the trend in business, asked 7600 of them for confidential estimates of volume.

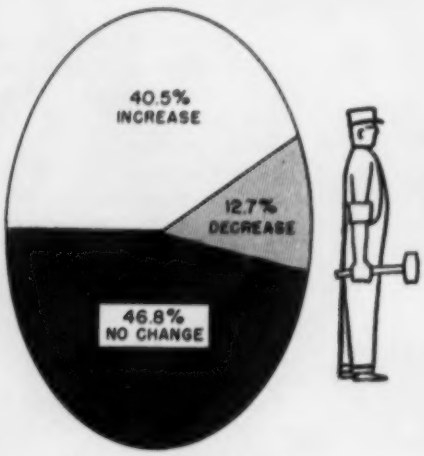
1955 METALWORKING SALES NEAR ALL-TIME PEAK



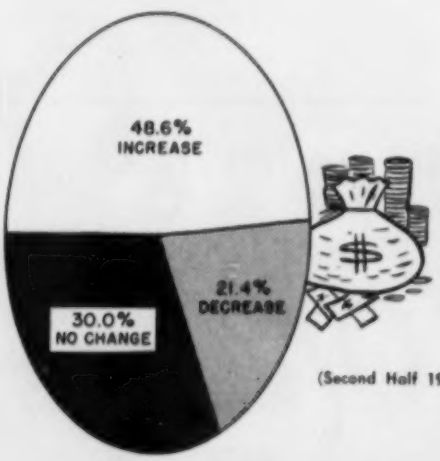
METALWORKING MANAGEMENT EXPECTS

Year's Volume Will Exceed 1954's by 9.1%





Employment Will Gain 1.3%



Profit Will Be 5.1% Higher

(Second Half 1955 vs. Second Half 1954)

prices, costs and other data. Results are shown in accompanying charts.

Good and Getting Better—"Business is the best ever," says an Ohio housewares fabricator. "Competition is keen, but we have a good product, a good price and a good market."

His comment is typical.

More than half the respondents believe second half volume will exceed that of the first six months. Only 15 per cent expect it will drop. The remainder expect volume to continue at the first half pace.

Sentiment has improved steadily through the first half. At the beginning of the year a similar survey showed only 38 per cent predicting a continued upswing in the second half. Many predicted a slump during the summer.

Employment Gaining—A net gain of 1.3 per cent in metalworking employment in the second half is predicted. More companies expect to work full weeks. Some companies express mild concern over the availability of skilled workers.

Four of ten companies expect to increase their working forces. Only one in ten anticipates a reduction.

Inflationary Bias—Strong business will bring an upward trend in manufacturing costs, distribution costs and selling prices.

Labor rates are expected to rise generally during the summer as new wage contracts are negotiated. Steel prices are expected to advance after the wage settlement in that industry.

As a result, two-thirds of those replying believe manufacturing costs will rise in the second half.

About 12 per cent believe they will be able to lower unit manufacturing costs despite the higher labor and material costs. They are counting on more efficient facilities now being installed.

Prices Going Up—Half the companies report they will try to hold present prices in the face of rising labor and material costs. Many qualify their expectation and admit they will have to raise prices if anticipated cost increases are substantial.

Thirty-seven per cent of respondents have decided to raise prices during the summer. Majority of increases will be between 2½ and 7½-per cent.

Price Cutting—A substantial minority complains that price cutting in their industries is making for a profitless prosperity.

A New England fabricator says the going is made tough because many competitors are taking work at below cost figures just to keep their shops busy.

A midwestern furnace maker says: "We wish our competitors would find a more realistic method of figuring their costs."

Complaints on price-cutting competition are especially noted in the structural steel, heating, some household appliance and miscellaneous metal fabrication industries.

More for Sales—Expenditures for sales, distribution and advertising will rise. Nearly half the respondents expect them to go up. Only a few will curtail such costs.

"Due to more advertising and a stronger and more progressive sales management, we are expecting our volume to increase in both 1955 and 1956," says a southern farm implement maker.

"To improve our competitive position," reports an eastern aircraft partsmaker, "we are emphasizing: 1. Expanded and intensified sales coverage. 2. Expanded and intensified product development."

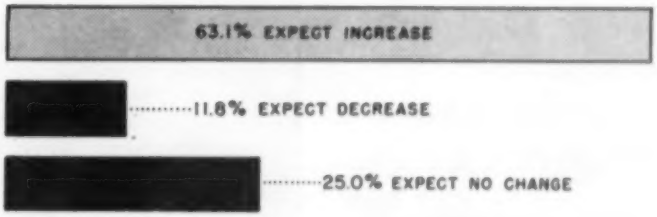
Expansion Continues—Although many companies still are integrating expansions completed in the last few years, three in ten are starting new expansions. Of those expanding, 22 per cent are building new plants, 45 per cent are adding to present plants and 95 per cent are adding new equipment.

New Products Coming—Forty-three per cent of the companies will introduce new products during the second half. The majority are related to present production although a considerable number of companies are venturing into new fields. New products account for a substantial number of the new plants being built.

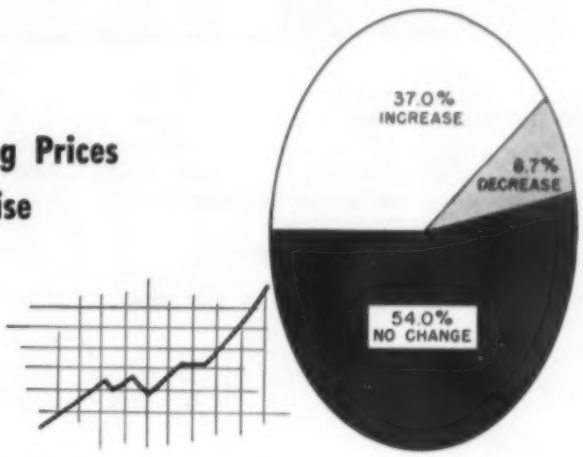
Profits Higher—Half the respondents anticipate earnings for

METALWORKING MANAGEMENT EXPECTS

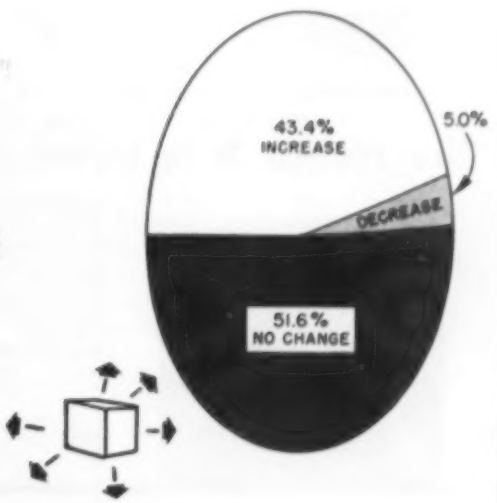
Manufacturing Costs To Jump



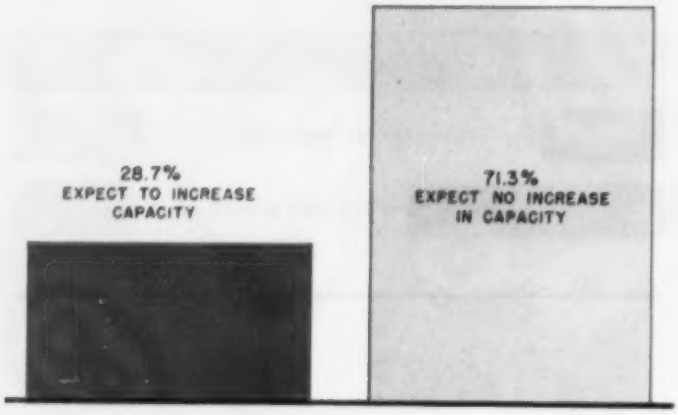
Selling Prices To Rise



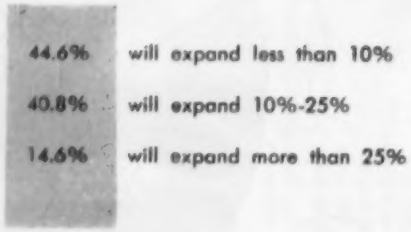
Sales, Distribution Costs To Creep Upward



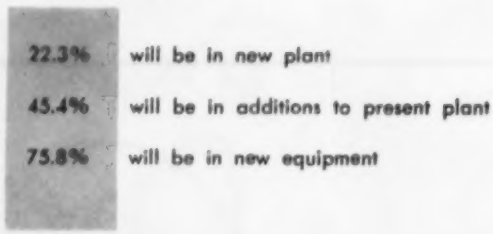
Capacity To Be Expanded



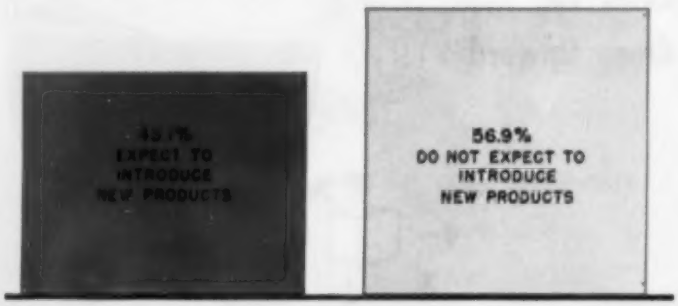
OF THOSE EXPANDING . . .



EXPANSION INVOLVES . . .



New Products To Be Introduced



the second half will be higher than they were in the second half of 1954. Only one in five believes profits will dip. The indicated net increase in metalworking profits for the second half of this year against the second half of 1954 will be 5.1 per cent.

Defense Work on Downgrade—Many companies expecting a decline in business attribute it to the dwindling of defense business. Some have lost their government contracts and are not established in civilian business. Several comment they intend to get out of defense work and into civilian business as soon as they can.

Competition from Abroad — A sprinkling of companies find low-price imports their No. 1 problem. Included are manufacturers of bicycles, sewing machines and some tools.

Optimistic—The over-all tone of comments by the executives interviewed is one of buoyant optimism. Although no questions were asked as to what lies beyond 1955, many volunteered their opinion that 1956 will be an even better year than the present and that we are entering an era of expansion and growth.

A number mentioned they have expansion programs being readied to start next year.

Many are looking toward more automation in their plants to cope with ever-increasing labor costs.

The problem of achieving real cost reduction received much attention. A large appliance manufacturer says: "Automation of machinery, tooling and methods is decreasing manufacturing costs but brings the penalty of amortizing huge new investments in capital equipment. Few industries have found a formula for real cost reduction and few have been able to give the consumer the benefit of lower prices resulting from mass production since World War II.

"Mass selling is in its infancy, and this is the answer to eventually reducing selling prices. The Henry Ford of mass selling is yet to come."

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*

NAM Weighs SUP

Supplemental Unemployment Pay "means that the union will have a hand in making company decisions," says NAM. Its Chicago meeting on the subject emphasizes political problems

AMID SHOUTS condemning GAW, one pertinent point was made at the Chicago meeting of the National Association of Manufacturers: Industry should not overlook the political aspects of Supplemental Unemployment Payments.

Political Split — Almost simultaneous with the NAM discussion of what legislative rulings are necessary to permit an employee to get both company and state unemployment benefits, the Ohio senate split (21 Republicans against; 12 Democrats for) in strict party voting on legalizing dual unemployment payments. The Democratic governors of New York and Michigan already are backing integrated unemployment compensation.

Congressman G. A. Barden, conservative Democrat from North Carolina, challenged the nearly 900 industrialists at the NAM conference to participate more actively in politics. "One problem," he said, "is to see that the CIO's power doesn't exceed in proportion the number of people it represents."

Ballot Results?—Survey figures, presented by Hugh Rusch, vice president, Opinion Research Corp., suggest that if GAW does reach the ballot stage, the public may turn it down. In recent ORC opinion polls, 65 per cent said that too high an unemployment benefit program would induce a man to stay out of work. Over 50 per cent believe that half of an employee's pay for a maximum of six months constitutes fair unemployment compensation.

One solution, Mr. Rusch says, is for industry to start an employee merchandising campaign designed to tell its workers how companies are planning for job stability, the problems involved and how each employee can help.

U.S. Steel Answers CIO

U.S. Steel Corp. has replied to the CIO United Steelworkers demand for a substantial wage increase. Though the answer was not disclosed, it is believed to have contained an economic argument that despite a continual rise in steel production, steel producers cannot afford an expensive wage settlement. Reason: Expansion is a must and capital for it must come in part from earnings. John A. Stephens, vice president, reports that the corporation is considering all factors, including the loyalty, co-operation and efficiency of a great majority of its steelworkers.

Small Business: Prepare for SUP Demands

WHILE THE National Association of Manufacturers discusses the political aspects of SUP, the U.S. Chamber of Commerce is contemplating how small business concerns are going to meet union demands for a supplemental unemployment payment.

Snare—The Chamber reports that many traps await the unwary small employer. It has prepared a guide for a company entering meetings on layoff pay proposals:

1. Determine exactly what the union proposal contemplates.
2. Do not accept any form of pattern bargaining.
3. Make a study to determine the number of employees and number of hours worked during the worst and best year. Divide the number of man-hours in the worst year by the number of employees in the peak year. This, says the Chamber of Commerce, probably will show that your company could guarantee only three or four hours a week.
4. During negotiations, have charts showing the sales, production and employment curves for the last 25 years. This will show progress in stabilized sales, production and employment.
5. A report showing payroll dollars, man-hour employment, overtime worked and layoffs for a selected number of years will show operational trends.
6. Make a seniority study.
7. Figure the cost of a SUP program.
8. Constantly remind the union and the public that state unemployment compensation is being paid by the employer.

Lewis-Shepherd Products Inc.

Materials Handling Sales Go Up

ORDERS for materials handling equipment are rising. Sales this year may hit $1.5 billion. For the first five months they were 18 per cent over the same period in 1954. Orders zoomed in April.

Directors of the Material Handling Institute Inc., Pittsburgh, predicted last December that sales this year would be 15 per cent higher than in 1954 and come close to 1953's banner year. By the end of May some hiked their estimate to 25 per cent.

New Record?—Spending in the third quarter may top the peak established in the third quarter of 1953.

Sparking the rising sales trend is industry's desire to be competitive. Manufacturers look to mechanized handling to cut costs and raise output per unit of machine time, labor and floor space. Most of the MHI directors credit automation with boosting their 1955 sales.

Opportunity—The new tax law provides for accelerated depreciation. Has it helped equipment sales? Opinion is evenly divided.

Almost all industries and services have stepped up their materials handling equipment purchases. Among the leaders are the automotive, chemical, plastics, pharmaceutical and food industries.

Fastener Sales Picture Bright

"An estimated $500 million to $600 million will be spent by industry on threaded fasteners this year," says Guy M. Coffrey, president, Chicago Pneumatic Tool Co.

The first half of the year is shaping up as one of the best, reflecting the activity of the mass production industries. Harry O. McCully, vice president sales, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., says that despite capacity operations, his company's orders still are in excess of shipments through early June.

The outlook is for some slackening during vacation months, which will be welcomed by producers as an opportunity to rebuild their inventories. But the lag isn't expected to last long. Industry prospects also include the possibility of a price increase, because of higher steel prices expected later this summer. For a complete roundup on the fastener industry, see STEEL, p. 159, June 20.

Powerama Joins Motorama

Diesel and aircraft power will have the spotlight in General Motors Corp.'s Powerama exposition on Chicago's lakefront from Aug. 31 through Sept. 25.

"Our aim in Powerama is to unfold the seldom heard but truly exciting story of how relative newcomers on the industrial power scene—diesel and gas turbine engines—are giving the nation new muscles . . ." says Harlow H. Curtice, president.

Highlight of the display is expected to be a new, lightweight, passenger train designed and built by GM at the request of a committee of railroad presidents. Well-known consumer products will be displayed, as well as the latest in land, air and marine equipment.

Offers Plane Chartering Plan

National Airlines is offering an executive transport plan for companies to charter Lockheed Lodestars. Two planes have been converted for the service; nine more will be ready by the end of the year.

Planes take up to ten passengers. A single price will include plane rental, operating personnel, flight costs and maintenance.

Subscribers will have an option to buy the plane with an allowance for part of the lease paid.

Machine Tool Orders Turn Up

Prospective price boosts and the AF's letting of $11.2 million in contracts are stimulating machine tool business. May orders were highest since August, 1953

THE AIR FORCE's $84-million machine tool program is under way. Four contracts worth $11.2 million have been signed, let and accepted.

Successful bidders are: Onsrud Machine Works Inc., $4.7 million; Farnham Division of Wiesner-Rapp Co., $6.1 million; Colonial Broach Co., $193,350; and Lapointe Machine Tool Co., $244,900. Contracts call for spar mills and broaching machines.

What It Means—Civilian machine tool ordering thus far for the year has hovered at about $60 million a month. Now, defense spending will provide the "cream" for the second half of 1955.

In May, new orders for machine tool builders rose to $72.1 million. The National Machine Tool Builders' Association reports that this is a $19.5-million increase over April and the highest total registered since August, 1953, when new orders reached about $84.8 million. During the first five months of this year, the new order total of $310.1 million has gained $76.9 million over the corresponding period in 1954.

Why?—One reason for the jump in May is that many machine tool producers allowed a grace period before raising prices. June also will be a high month as the $11.2 million let by the AF will show up in industry reports.

Future—The Army, Navy and Air Force are scheduled to submit listings of machine tools and production equipment which they need for mobilization reserves. The secretary of defense is establishing a $100-million fund, to be taken from fiscal 1956 appropriations, which will be used to buy the necessary machine tools and production equipment. The listings will only be allowed to include tools and equipment which have a manufacturing cycle time of six months or more, or a mobilization lead time minimum of one year.

Sidelight—Brig. Gen. Clyde H. Mitchell, deputy director for production, Air Materiel Command, states that the AF wants to own as few machine tools as possible and that special consideration will be given to manufacturers which are willing to shoulder the responsibility of purchasing new types of tools to fulfill AF contract specifications. Notable exceptions to this trend will be AF heavy presses and special tools.

C. M. White Heads Up Republic

Tom M. Girdler, chairman of Republic Steel Corp., Cleveland, turned over his duties as chief executive officer to Charles M. White on June 21. Mr. Girdler has been a Republic executive since the company was organized in 1929. He is 78 years old, and will continue as chairman.

Mr. White, who also has been with Republic since 1929, was elected president in 1945. He is 64. Since that time the corporation's steel ingot capacity has been increased from 8.6 million to 12.3 million tons a year.

Made for the Job

Being lowered onto a specially built flatcar at General Electric Co.'s large steam turbine-generator factory, Schenectady, N. Y., is 180 tons of high pressure generator stator. The flatcar was designed by GE and Pennsylvania Railroad engineers to expedite shipment of large steam turbine-generators. The stator shown is for one of six 200,000-kilowatt generators being manufactured by GE for the Ohio Valley Electric Corp.'s Clifty Creek plant near Madison, Ind.

Thompson Backs Electronics

A year ago, Frederick C. Crawford, chairman of Thompson Products Inc., Cleveland, remarked that its affiliate in the electronics field, Ramo-Wooldridge Corp., Los Angeles, "will be as big or bigger than Thompson itself in ten years."

Last week the Cleveland company signaled its continued faith in that forecast by working out an arrangement to put $20 million behind a further expansion of the electronics company.

The new Thompson move eventually may secure an 84 per cent interest for the Cleveland company in Ramo-Wooldridge. Today, officers of each company serve on the board of the other, and majority control remains in hands of key Ramo-Wooldridge employees.

Auto Parts Investigation Due

Edward F. Howrey, Federal Trade Commission chairman, reveals the near completion of a general investigation of: 1. Possible violations in the sale of auto parts by parts manufacturers. 2. A special investigation of complaints against General Motors Corp. in the sale of Chevrolet parts. A number of independent auto parts distributors, jobbers and dealers allege that Chevrolet owners are being led to believe that genuine Chevrolet parts can only be obtained from franchised dealers.

Mr. Howrey reports that the commission has an understanding with the Justice department's Antitrust division under which Justice takes on the auto industry and FTC deals with the parts industry. FTC also has received complaints against Ford Motor Co. which have been referred to the Justice department.

Wide World

Mock Atom Test Blasts Theories

COMING UP is another reappraisal of the nation's industrial mobilization policy.

This one will be sparked by Operation Alert. In that mock test of readiness at midmonth, a theoretical 60 per cent of U. S. industrial capacity was knocked out, including 70 per cent of our steel potential.

Questions—If that were to happen in a real atom attack, the immediate question pops up: What's the sense of our present pattern of industrial expansion when most of it probably could be turned to rubble anyway?

The basis of present planning for mobilization is, primarily, to stockpile capacity to produce. For economic reasons, dispersion of capacity has not been great.

Civil defense experts claim it's impossible to stop completely a surprise attack. Some production plants are bound to be demolished. So, what can be done to assure getting back into output as fast as possible? At least three approaches, or combinations of them, appear possible.

1. **More Materials Stockpiling**—We stockpile basic commodities now, of course. And the practice is contributing to shortage problems, particularly in nickel, aluminum and copper.

2. **More Semifinished Stockpiling**—Industry would object even more to this. It involves complex storage problems and labor investments that make the practice undesirable.

3. **More Dispersion**—This approach appears the most likely. At least, there will be more emphasis on dispersion. Only through the granting of fast tax amortization can the government directly control plant location.

Delay in Steel?

The mobilization reappraisal may delay a government decision to open up the expansion goal for steel. A decision originally was expected by autumn. Now it may be later.

Already, however, most of the big steel companies have requests in at the Office of Defense Mobilization for fast tax write-offs on big projects. The general thinking is that additional capacity is needed for about 9 million product tons. That would mean an expansion of some 12 million tons in ingots.

Quote of the Week

Says Judge Stanley N. Barnes, head of the Justice department's Antitrust Division: "Litigation on the Bethlehem-Youngstown merger may well be in the offing." That remark, plus comments by Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. executives, convinces many Washington observers that the two companies will go ahead with merger plans and seek rapid judicial clarification.

Lease on Life

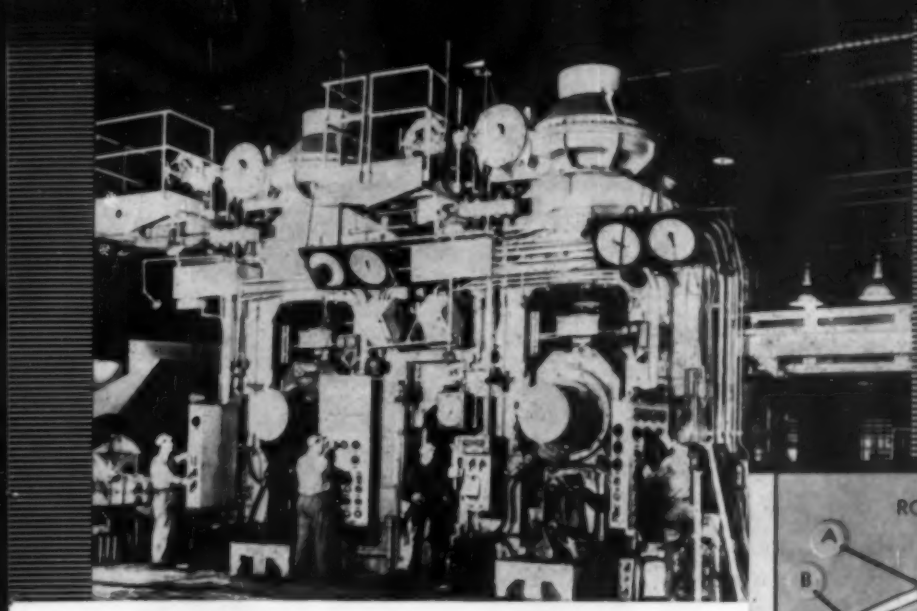
Titanium should get a new lease on life with stepped-up production of the B-52. The airframe takes about 1800 lb of the metal, not to mention the amount required in the engines.

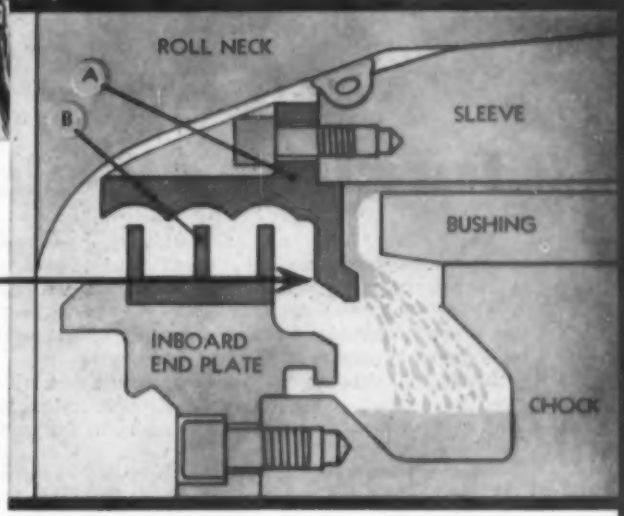
Capital Comment

• Look for the Corps of Engineers to approve a project to deepen the channel in the waterways between Lake Erie and Lake Huron. It would be from the present 25 ft to 27 ft to tie in with the 27-ft channel that will be available in the St. Lawrence Seaway.

The cost will be an estimated $110 million, which must be appropriated by Congress. Now that legislators have bought the basic seaway idea, proponents of the 2-ft dredging project expect little opposition. Yet, these things take time. Congressional action probably won't come until 1956.

• The Republicans are embarrassed about stand-by wage-price controls. They don't want to come out flat-footedly and ask for them—hence, the vague wording on the matter in Sen. Homer E. Capehart's proposed amendments to the Defense Production Act. They had hoped the Democrats would introduce a stand-by control bill which the Republicans then could "reluctantly" accept. But the Democrats refused to be mousetrapped.





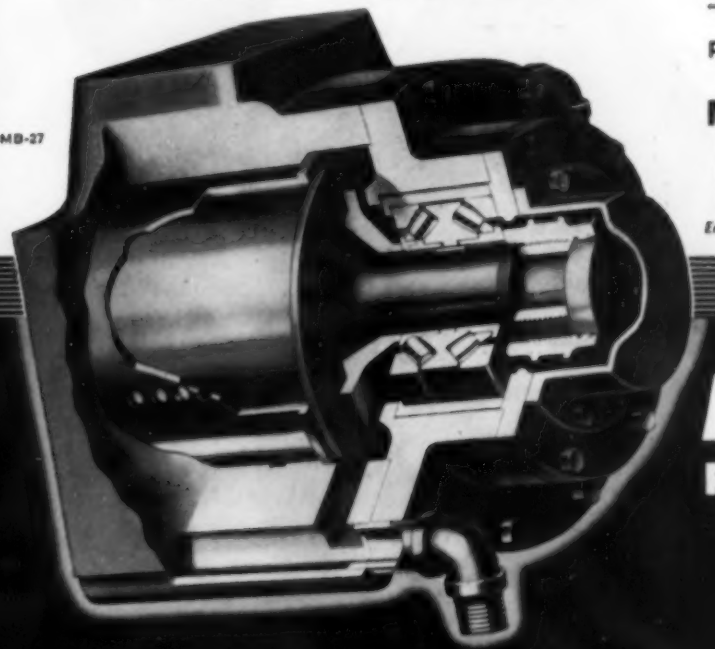
THE MORGOIL FLINGER

is the answer on dry mills where oil leakage is taboo

A The rotating sleeve extension and flinger "A" throws oil from the bearing directly into the drain sump.

B Any oil that might sneak by is caught in the grooved ring "B" and also returned to the sump.

Rubbing oil seals are completely eliminated.



MB-27

The high speed tandem tin-temper mill of Jones & Laughlin, Aliquippa, Pennsylvania, illustrated, is one of the many dry mills enjoying this feature. This proven development is only one advantage of the modern Morgoil Bearing —the roll neck bearing that gives you the best performance at the lowest cost.

MORGAN CONSTRUCTION CO.

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MORGOIL
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BALANCED TO YOUR NEEDS

J&L STEEL

quality forging steels

Machinability, forgeability and heat treating properties—these are the steel qualities that must be balanced correctly to cut your operating costs and improve finished part quality.

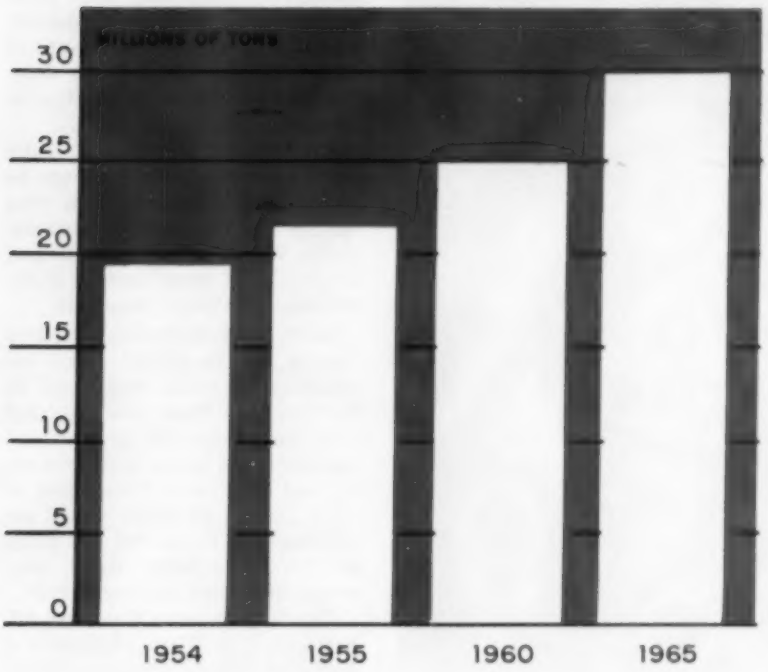
At J&L strict metallurgical control of every operation from ore mine to finishing mill assures production of forging steels with the exact balance of properties you require.

In addition, J&L is prepared to help establish the particular specifications that give you the most desirable results. J&L's staff of experienced metallurgists is available to analyze your requirements.

Whether you are producing rugged, heavy-duty forgings or lightweight, high-strength parts, you'll find it profitable to use J&L steels.

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

German Steel Production Outlook



U.S.' Stake in German Steel Boom

GERMAN steelmaking is on the verge of a ten-year boom. By 1965, look for production to hit at least 30 million tons, 58 per cent up from current levels.

What will be the effects on American industry?

Machinery — Fritz Berendsen, director of Klockner Steel Co., reports that an American continuous strip mill will be bought for a German "Fairless works" to be built at Bremen. H. Th. Brandi, a top executive of Phoenix Steel Co., says that because modernization is the immediate need, coilers and similar specialized equipment will be bought.

Mr. Brandi sums up immediate product needs: "Heavy sections—adequate; bar, wire rope, sheet, wide strip—inadequate. The next few years will see a snowballing demand for wide strip, as our first mills get the product on the market."

Competition — Remember, however, that Germany is an important steel plant builder in her own right. Demag of Duisburg is building eight steel plants in several countries, including India and South America. Mannesmann and Vereinigte Rohrenwerke are building tube mills in Brazil, Canada and Turkey. Krupp is building an integrated mill in Pakistan. Prospects are for this type of competition to intensify.

Ore—Sweden has been West Germany's main ore source. But the steel companies (which buy on a co-operative basis) are looking to America for alternative supplies. This month it was announced that a group of companies representing 95 per cent of German steel capacity had negotiated a contract with Canadian Javelin Ltd., which controls the Lake Wabush deposit in Newfoundland. A beneficiation plant is to be built at the mines by Klockner-Humboldt-Deutz Inc., and ore will be shipped by spring of 1957. The contract calls for the purchase of up to 3 million tons of ore a year on a long-term basis. U. S. ore interests are negotiating agreements with the Germans.

Know-How — A great deal of American know-how will go into the expansion program. Examples: Armco Steel Corp. will assist Stahlwerke Bochum with the production of high quality electrical steels, and has granted the German company a license for the manufacture of silicon steel sheets using Armco methods. Yoder Co., Cleveland, is helping build a large pipe factory for two German plants. Some $250,000 of its equipment will be installed in the finished plant.

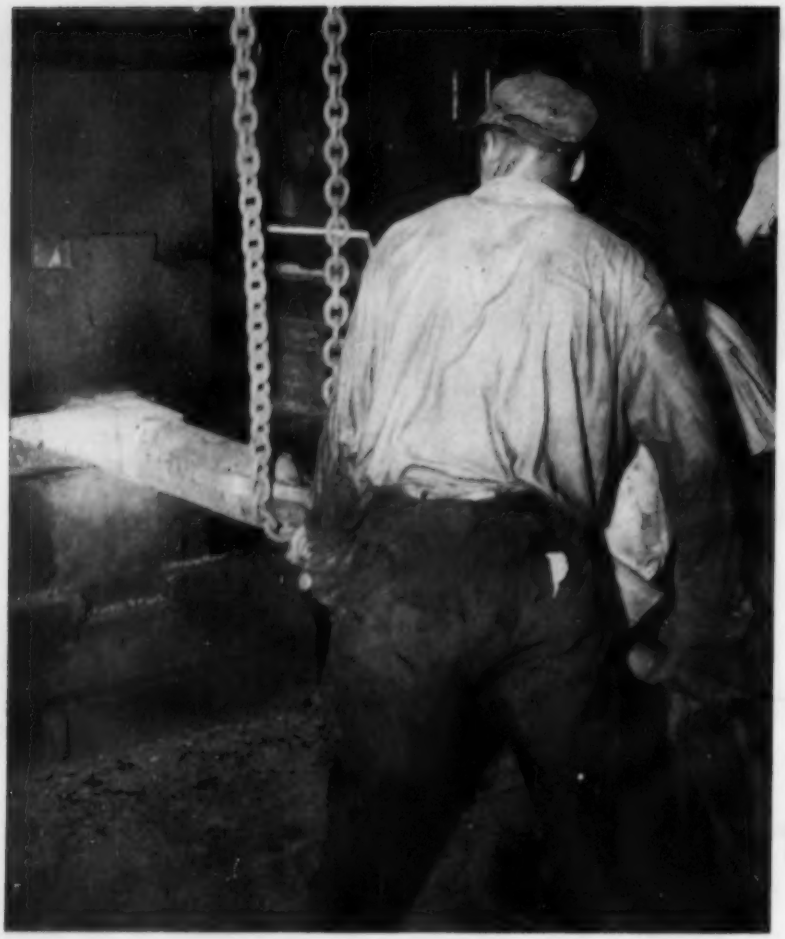
Scrap—One bottleneck in the German expansion picture is the scrap situation. Remarks Mr. Brandi: "Our scrap problem is acute. And it will not get any easier. The high proportion of output is now going into thin sheets for auto and other consumer goods. Where once we got back a rail as scrap, now we get a tin can."

Exports — Germany does not compete too strongly with the U. S. for steel export markets. Her total exports are running about 4 million tons a year; exports of iron, steel and steel mill products to the U. S. only amounted to 2.9 million tons over the 1950-1954 period.

Balance — What's behind the coming expansion in Germany? Per capita consumption of steel in West Germany is about 800 lb, as opposed to 1500 lb per capita in America. The German domestic market reflects the coming of prosperity to Europe. Machinery, construction, consumer metalworking, automobiles and jobbers are the main customers (in descending importance) of the German companies. Demand is spread well over and through those industries.

Today, with production hitting new highs month by month, some mills are booked into next year. To satisfy domestic demand, some 250,000 tons of rolling mill products must be imported each month.

Outlook—Points out Dr. Herbert Gross, STEEL's German correspondent: "If the impending unification of the German east and west zones should happen, a large expansion would have to take place. There is no important steel mill in East Germany; there are at least 17 million Germans; and reconstruction has not been carried on under the Russian bosses."



With orders and shipments on the uptrend . . .

Forgers Pound Out a Good Year

VOLUME IS UP; prices are not—that is the picture of the drop forging industry. Last year was a poor one for drop forgers; sales were $478 million. This year they should be up nearly $100 million.

Last year's increases in labor and steel prices were not passed on to forging buyers. Now competition is so keen that drop forgers fear that once again they may be caught in the squeeze of rising steel and labor prices and a competitive price level.

This Year—Business for the drop forgers promises to be 15 to 25 per cent better than in 1954. In March, steel forging shipments hit a 16-month high and unfilled orders reached their highest level in a year.

But competition is sharp. It takes ten quotations to get one order. As one industry leader puts it: "Prices are so low that any substantial drop in business will put us close to the break-even point."

During the second half of the year orders are expected to stay where they are or even improve. Deliveries should be speeded as orders for steel are filled sooner.

Cornell Forge Co., Chicago, expects business in the second half of the year to be up 30 to 40 per cent over the like period of last year. Its key markets are in the automotive, farm implement and machinery fields.

Defense Work — Production of forgings for defense is nowhere near the 50 to 60 per cent mark it was a few years ago. Many forge shops have only 10 to 20 per cent of their business in defense orders. In the last two years forgers have seen their defense orders either hold constant or drop. Despite the over-all drop, few find their total level of sales affected.

Supersonic fighter planes require ten times as many forgings as World War II models. But drop forgers say they have enough capacity for all except the largest forgings. Of more concern is the shortage of skilled diemakers.

GAW, Ouch — Commercial drop forgers are concerned about the guaranteed annual wage and its implications. Even now they feel that the industrial giants with captive forge shops pull in work to keep their labor forces busy in slack times. If GAW should accelerate this trend and job shops are forced to adopt GAW, they would be behind the eight ball.

The forgers have these two advantages: 1. They are riding a long-term trend: Each year shows an increase of 0.42 lb per capita in the sale of forgings. 2. By heating and hot mechanical working they make a product that concentrates grain structure and fiber formation to get the highest possible strength and toughness.

Big Investment—To do a variety of jobs, the drop forgers must have a large investment in equipment—drop hammers, ovens, reducing rolls, forming presses, upsetters and swedging rolls. But even at a high level of production, it is difficult to keep all machines loaded. There are more machines than operators.

Scientists Turn to Nitrogen

Nitrogen is becoming an increasingly valuable alloying element for new steels which are being used for jets, gas turbines and in various atomic applications, says the American Iron & Steel Institute.

Example: A steel was developed for high strength under extremely hot temperatures. By increasing the nitrogen content and reducing the amount of other alloy elements, the steel was improved for its end use. The presence of a nitrogen compound in steel also has improved its fracture resistance in cold weather.

What Industry Needs To Spend* on Equipment . . .

(billions of dollars)

	If it expands 3% annually			If it expands 4% annually		
	TOTAL	EXPANSION	REPLACEMENT	TOTAL	EXPANSION	REPLACEMENT
1955	22.16	11.79	10.37	22.16	11.79	10.37
1956	22.78	11.45	11.33	23.39	12.03	11.36
1957	23.13	11.02	12.11	24.35	12.19	12.16
1958	23.36	10.51	12.85	25.23	12.32	12.91
1959	23.45	9.90	13.55	26.07	12.43	13.64
1960	23.45	9.20	14.25	26.87	12.51	14.36
1961	24.33	9.47	14.86	28.08	13.01	15.07
1962	25.55	9.76	15.49	29.30	13.53	15.77
1963	26.16	10.05	16.11	30.53	14.07	16.46
1964	27.08	10.35	16.73	31.76	14.63	17.13
1965	28.01	10.66	17.35	33.02	15.22	17.80

*Projections by Machinery & Allied Products Institute based on 1953 dollars.

We Need More Equipment—MAPI

THE NATION'S capital equipment expenditures may jump 50 per cent in the next decade.

That conclusion can be drawn from projected installation needs developed by Machinery & Allied Products Institute and revealed to delegates at its annual Washington conference.

Optimism — MAPI admits that its estimate of a 3-per-cent annual growth is ultraconservative and that even its projection on the basis of a 4-per-cent growth could well be too low (see table). Its lower estimate that installation requirements for equipment may hit $28 billion by 1965 is probably pessimistic. Its higher estimate of a $33-billion need for equipment by 1965 may be conservative.

Automation, it points out, could mean that the stock of equipment hereafter will rise faster than output.

A Little Behind—Plant expansion has been running lower than equipment growth. On the basis of a 3-per-cent growth assumption in plant, outlays could reach $15.4 billion by 1965, compared with $9.8 billion this year. On a 2-per-cent growth assumption, outlays will reach only $11.4 billion by 1965.

MAPI bases its analysis partly on estimates of current stocks in plant and equipment. In 1953 dollars, we have $250 to $300 billion in equipment, slightly below plant stocks.

Below the Trend—If predepression trends had continued, the institute estimates equipment stocks would be $300 billion; plant, more than $400 billion.

Attacking claims that we have been in a dangerous plant and equipment expansion boom, MAPI says: "In the case of plant, no boom has been visible at any time, and present stocks appear unprecedentedly low. As for equipment, where there has been a boom by historical standards, the heavy postwar installations do not appear even to have restored the stock to normal, to say nothing of overshooting the mark."

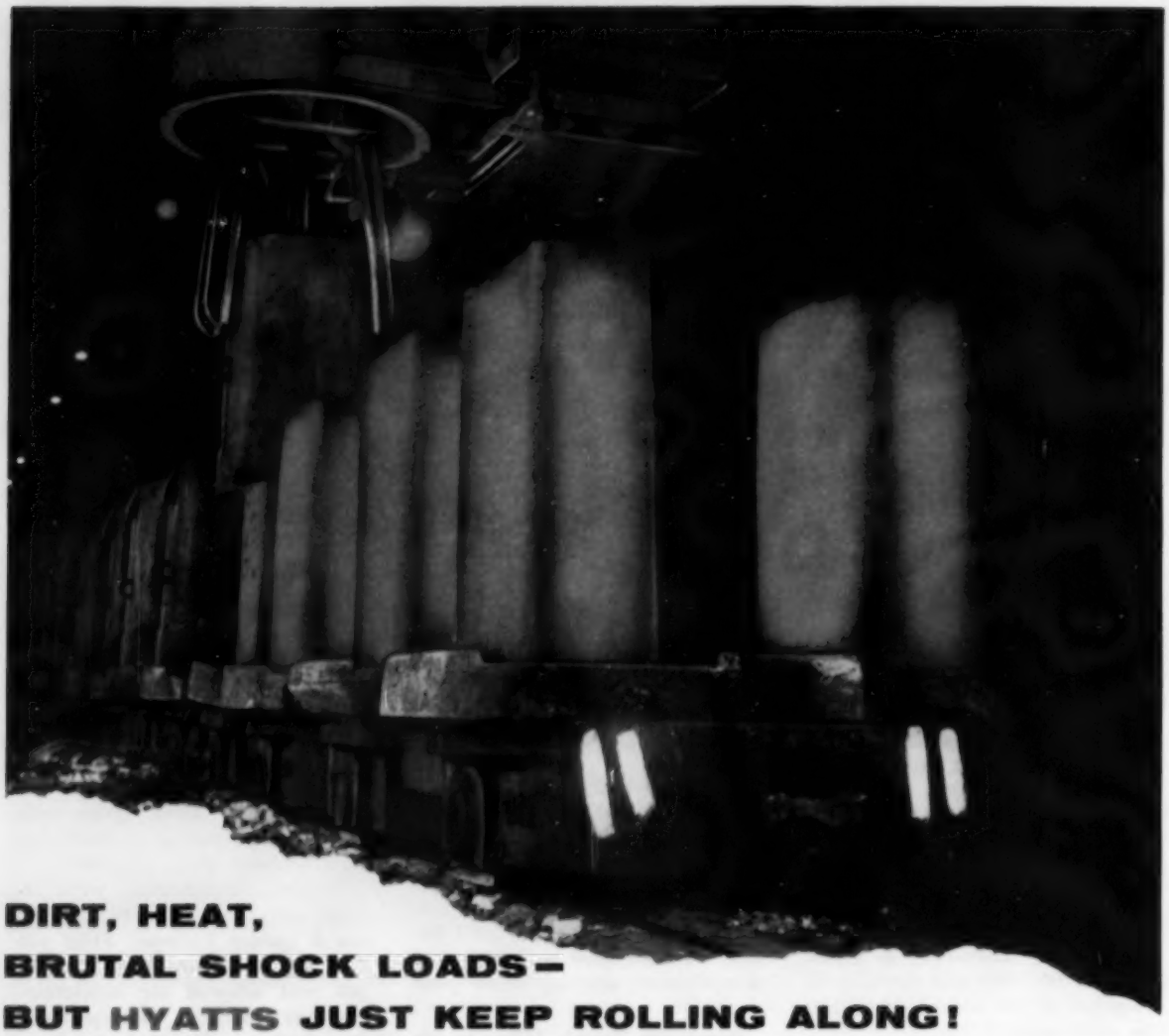
ODM: Tax Write-Off for 95

From May 19 through June 1, the Office of Defense Mobilization issued certificates of necessity for accelerated tax amortization amounting to $70.3 million. Out of a total of 95 certificates, 15 were for small business facilities, which accounted for $2.2 million of the total. ODM gives them special consideration to encourage small defense plant expansion.

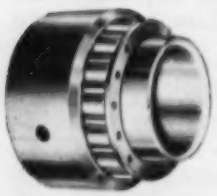
Largest certificates went to three companies: Chicago, Burlington & Quincy Railroad, $10.6 million for diesel locomotives, with 55 per cent allowed for accelerated tax amortization; Chesapeake & Ohio Railway, $9 million, for diesel locomotives, with 55 per cent; and Oregon Short Line Railroad, $8.9 million for a centralized traffic control system and passing tracks, with 40 per cent. U. S. Steel's Oliver Mining Division was issued a certificate for iron ore treatment facilities amounting to $3.9 million, with 65 per cent allowed. Aluminum Co. of America was granted a certificate for aluminum sheet and heat-treating facilities for $2.5 million, with 50 per cent allowed for fast tax amortization.

Porter Buys Vulcan Crucible

H. K. Porter Company Inc., Pittsburgh, purchased Vulcan Crucible Steel Co., Aliquippa, Pa., manufacturer of tool steel. James O. Flower, formerly president of Vulcan, will be vice president and general manager of the new Porter division.



DIRT, HEAT, BRUTAL SHOCK LOADS— BUT HYATTS JUST KEEP ROLLING ALONG!



Keep your production rolling profitably with

You're looking at a mighty tough spot for a roller bearing—the 7-inch axles of an ingot car that carries an 80,000-lb. load. That's why we think it's significant that the steel industry has *far more HYATTS on ingot and charging cars than any other make.*

Take these at Jones and Laughlin Steel Corporation's Cleveland Works, for instance. J & L has found that: HYATTS greatly reduce friction and starting power needs—permit longer trains, faster and smoother car spotting. HYATTS operate dependably despite abrasive dirt, constant heating and cooling, and pile-driver shock loads when the stripper has to pound 10-ton ingots free from the molds. Their straight cylindrical design permits lateral expansion without cramping rollers, and ample reserve for overloads. HYATTS *virtually eliminate costly downtime.* Month after month, they absorb this brutal beating and keep coming back for more! Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER

Needed: Answers to corrosion problems like this as . . .

Auto Engineers Size Up Future

EACH YEAR the auto engineers' meeting in Atlantic City becomes more like the boardwalk in its competing bids for attention.

This pattern of several interesting sessions going on at the same time left many attenders feeling the frustration of a kid at his first three-ring circus.

Corrosion—One of the interesting papers presented was that of Alfred L. Boegehold, assistant to the general manager of General Motors Research Laboratories; Dr. Robert F. Thomson, head of the Metallurgy Department; and J. C. Holzwarth, metallurgy supervisor. Describing an accelerated corrosion test, they reported that results ordinarily requiring up to three years of outdoor exposure testing at Kure Beach, N. C., can be obtained in 20 days in the laboratory.

Bare steel panels are suspended in a constant temperature cabinet at 125° F while air varying in humidity from 100 to 10 per cent passes over them in 8-hour cycles. Every day the panels are wetted with a dilute salt solution and each humidity cycle produces a new layer of rust.

Other Uses—The obvious value of this test in quick evaluation of corrosion resistance might well be applied to the steel itself as well as to the improvement of design and protective coatings, the observers feel. Except for wrecked cars, the GM researchers point out that nearly all the 3 million cars scrapped annually are rusted beyond economic repair. And they note that there has not been any significant improvement in corrosion resistance of auto body sheet steel in the last quarter of a century.

To bolster the need for an improved steel, they point out that the exterior corrosion usually is controllable because it is visible to the owner and is waxed or painted. It also is subject to the washing action of rain which removes soluble corrosion products facilitating the formation of protective rust. Corrosion in such areas as the interior of the rocker body, however, may proceed undetected until severe damage or severe perforation of the steel occurs.

Rough Rust—In addition, the soluble corrosion products are not washed away. They remain in the rust causing high porosity. Where the steel remains wet for long periods without benefit of drying, the rust remains nonprotective, and the constant presence of moisture accelerates corrosive attack. A rocker panel has corroded through from the inside in less than four years due to the retention of moisture.

Citing the fact that improved design to eliminate crevice areas would eliminate the cause, the observers note that this is not always practical. Likewise, continuous coating of the crevices with mastic materials to protect against moisture is not often possible since they are inaccessible by nature. That's why GM researchers conclude that one of the best places to start is in the steel itself.

Cost Conscious—High strength, low alloy steels at a cost about 1.5 times that of presently used rimmed steel have not offered enough conclusive proof of corrosion resistance, they feel, to justify the premium. Their goal is a material which corrodes at about one-fourth to one-half the rate of present

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steel. However, such an improvement would have to be done without the addition of large amounts of alloying elements which would affect the forming characteristics and cost of the steel.

One possible avenue of solution to the problem is presented in preliminary results of the accelerated corrosion test. Two auto body materials and a typical high strength, low alloy material, each containing about 0.10 per cent carbon, were gas carburized to about 1 per cent carbon. Each material showed a decrease of more than 50 per cent in corrosion due to the carburizing treatment. Unfortunately, high carbon steels cannot be used for auto bodies because of their poor forming characteristics.

On the Road—The possibility of gas carburizing after forming for certain body panels is a step which may well be considered. Meanwhile, present work is being directed toward finding an additive or combination of elements which, like carbon, will produce increased resistance to sheltered corrosion at low cost but not affect forming characteristics. The GM research test promises to be an important tool in the quick appraisal of such materials.

One cannot help wondering if many customers in the interim would not be willing to pay the premium for presently available materials in panels most subject to corrosion.

Safety—Automotive safety finds an excellent champion in P. C. Ackerman of Chrysler Corp. who points out that the accident toll often is unrealistically attributed to alleged and intrinsic defects of the automobile. He notes that the auto industry has been moving for greater safety on three fronts: First, to design cars that can be driven in a manner to reduce the likelihood of accidents; second, to design cars that will minimize the effects of an accident on its occupants; third, to promote highway construction to reduce the number and severity of accidents.

He points out that automobiles cannot be designed that will make up for all the ineptness, carelessness or selfishness which human beings are capable of. A vehicle proofed against head-on collisions would be grotesque in appearance and unsalable. Hence, he feels, giving the driver greater agility, better stopping ability, more maneuverability and response to controls and better visibility are the best approaches to safety.

Transmission Report — Observing that the day when automatic transmissions are standard equipment on all vehicles is not far off, C. J. Lucia and J. Z. Delorean of Studebaker-Packard Corp. point out that the new Twin-Ultramatic transmission is the lightest unit on the market to embody competitive performance and durability features. They note, however, that even this unique unit requires much work for success functionally and economically, despite extensive use of shell moldings, needle thrust bearings, molded nylon speedometer gear and shaft and plaster casting of the torque converter.

Also of twin turbine design is the Buick variable pitch Dynaflow. R. J. Gorsky reports that one of the problems of the variable pitch stator was to arrive at a design which could provide the greatest benefit to car performance and still be manufactured on a high production basis at reasonable cost. Among techniques used are the shell molding of stator blade carrier sections, sintered powdered iron in the stator piston or crank actuator, a sheet metal stamping in the outer ring or shroud and hot aluminum extruded blades cut from hot-extruded cold-drawn bars.

Riddle of the Ride—The problem of translating the psychological and physiological sensations of ride and handling into passenger car suspension design was cited by A. C. Bodeau, R. H. Bollinger and L. Lipkin of Ford Motor Co. Observation through driving various cars is limited because it depends upon the observer's memory to draw comparisons. He cannot drive more than one car at a time. And the sharpness of the observer's perceptions are subject to his moods and prejudices.

Also entering into the picture are experimental analyses which are a problem in dynamics. This involves a collection of springs, masses and dampers which the ride analyst studies both in terms of the motion of the system and the interaction of the various components. To do this, the passenger's body must be considered a part of the system.

The Bottom of It—Upon the basis of the experimental analysis can be formed a system for mathematical analysis. This evolves through deriving the differential equations for the suspension system, solving the equations for constants and obtaining a number of numerical solutions for the response of the system. It is here that push devices like the analog computer come into play. It took 1500 solutions of one algebraic equation to determine the frequency of response of the sprung mass for various engine mount spring rates.

Through the use of such equipment, suspensions which today are largely developed through observation will in the future become more and more paper designed, subject only to verification through the response of the passenger.

Thus, a few random selections from the golden anniversary meeting of the Society of Automotive Engineers at Atlantic City. Less comprehensible to the public than the stylists, the engineers continue their important work of designing the best possible bones and muscles for the stylist to cover with his multicolored skins that seem to catch the car buyer's fancy.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	912,791†	621,318
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		516,395
December		761,954
Total		6,885,066

Week Ended	1955	1954
May 21	221,936	157,993
May 28	209,939	148,733
June 4	163,731	119,688
June 11	172,794	139,312
June 18	183,987†	140,063
June 25	188,000*	140,695

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

NEW DEPARTURES OF TOMORROW

Today, New Departures are used by almost every manufacturer of farm equipment. That's because New Departure ball bearings have proved their ability to carry all loads, preserve accurate alignment of moving parts, cut friction and upkeep.

How you gonna keep 'em *away* from the farm after they've seen this machine? . . . Chances are, the people who develop this **soil-conditioner, fertilizer-planter unit,** with its air-conditioned control cab, will call on New Departure for ball bearings. Maybe they'll just need New Departures that are already in world-wide use—like the Sealed-for-Life or the double-row angular-contact ball bearings. Or they might want an entirely new type—a "new departure" in ball bearing design. Either way, New Departure is the answer. Manufacturers everywhere know that New Departure always lives up to its name—being *first* with the finest in ball bearings.

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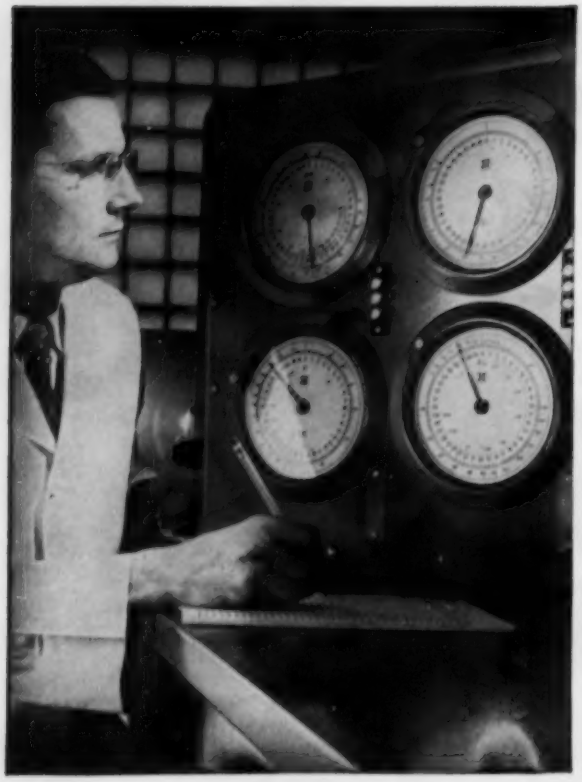
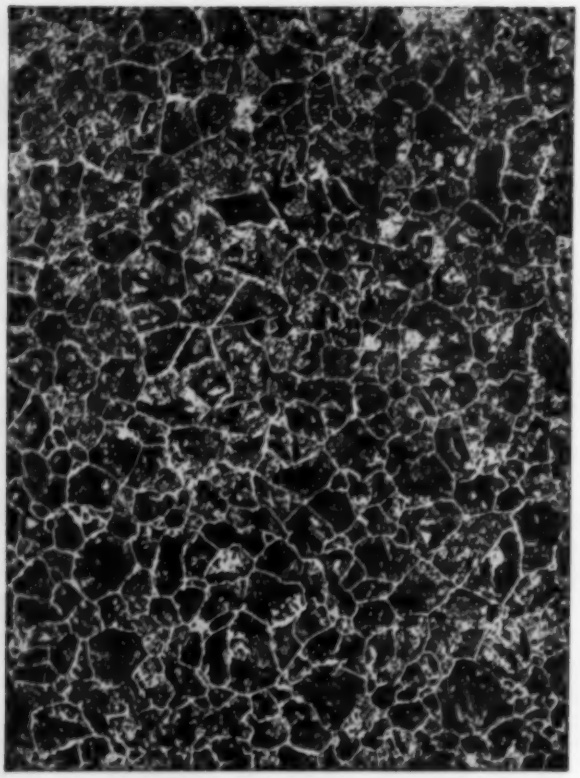
NEW DEPARTURE
BALL BEARINGS

NOTHING ROLLS LIKE A BALL





Meet two of the reasons why TIMKEN® forging steels give you uniform, high-quality forgings

THE man on the left helps assure you of uniform composition in every Timken® steel forging bar. With this spectrometer, he can tell the exact composition of a melt in just 40 seconds. Results are flashed back to the furnace so the melter can maintain constant control of the heat analysis up to the instant of pouring.

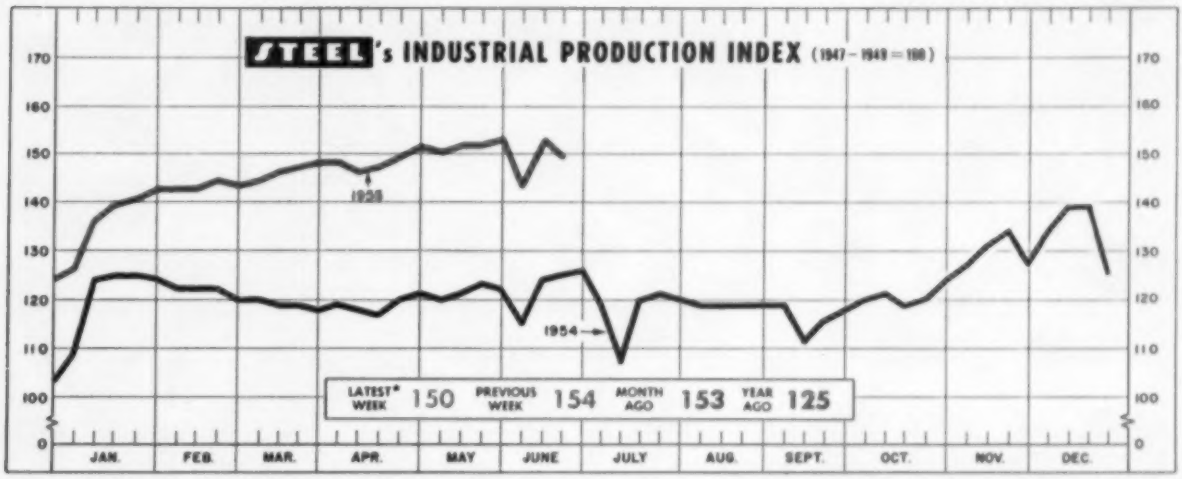
The photomicrograph at right shows the uniform grain size of the Timken forging steels. Uniform grain size after heat treatment is assured by spectrometric or microscopic examination of every heat. The result—you can be sure that forgings made from Timken forging steels have uniformly high ductility and resistance to impact.

But that's only part of the story. You can hold rejects to a minimum because we condition the steel to fit your particular forging requirements. And you save steel because the good dimensional tolerances of Timken forging steels produce uniform weight multiples with a minimum of steel lost in flashings. You even have fewer furnace adjustments because Timken forging steels respond uniformly to heat treatment.

For help in improving the quality of your forgings and cutting production costs, write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended June 18. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Autos Slow for Early Change-Over, Orderly Cleanup

AUTOMAKERS finally put on the brakes.

Only a month ago, 1,783,000 cars were scheduled to be turned out in the July-September quarter. Now the goal has been cut back 12 per cent to 1,560,000, says *Ward's Automotive Reports.*

Variance — That means output will be 26 per cent under the 2,214,000 units expected to be built in the present quarter, about the same percentage dip as last year.

Company-to-company cutback plans vary widely. General Motors expects third-quarter output to drop 19 per cent under present-quarter levels; Ford, about 24 per cent; Chrysler and the Independents, 44 and 55 per cent, respectively.

Timetable—The larger percentage cutbacks by Chrysler and the Independents doesn't mean they're giving up the ghost. The change-over timetable is a big factor. Chrysler, for example, plans to shut down about a month earlier than last year's late-August date. On the other hand, one of the big producers may extend its 1955 model run for several weeks because of recent low production weeks or encouraging market factors, or both.

Dealer inventories are another important item affecting third-quarter plans, which are regarded by some as optimistic. The aim is a cleanup as orderly this year as last. With dealer new car stocks at an all-time high, it may take some doing.

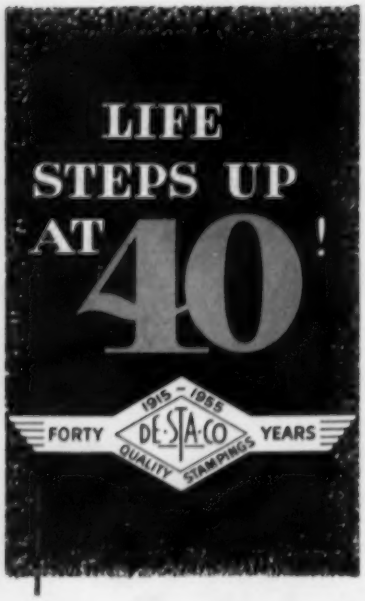
Sales—Working in that direction, though, are firm new car sales going into June. At GM, President Harlow H. Curtice says retail sales of GM passenger cars in the first ten days of June reached a new high for the period. Every division of the company set all-time new and used-car sales records.

If sales of other makes are holding up anywhere near that well, it means stocks still are below the 31-day supply level of a year ago. Likely to help sales through the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,350[1]	2,316	1,720
Electric Power Distributed (million kw-hr)	9,850[1]	10,041	8,850
Bitum. Coal Output (1000 tons)	9,350	8,730	7,571
Petroleum Production (daily avg—1000 bbl)	6,625[1]	6,600	6,495
Construction Volume (*ENR*—millions)	$328.0	$378.3	$317.9
Automobile, Truck Output (*Ward's*—units)	183,987[1]	172,794	140,063
TRADE			
Freight Car Loadings (1000 cars)	790[1]	787	707
Business Failures (Dun & Bradstreet, no.)	219[1]	230	207
Currency in Circulation (millions)[3]	$30,058	$30,059	$29,803
Dept. Stores Sales (changes from year ago)[4]	+3%	+5%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,860	$19,603	$20,263
Federal Gross Debt (billions)	$277.5	$277.4	$274.1
Bond Volume, NYSE (millions)	$24.4	$25.7	$16.3
Stocks Sales, NYSE (thousands of shares)	13,388	14,512	8,515
Loans and Investments (billions)[4]	$84.0	$84.2	$80.1
U. S. Govt. Obligations Held (billions)[4]	$32.8	$33.0	$33.2
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.75
STEEL's Nonferrous Metal Price Index[6]	238.1	237.4	214.1
All Commodities[7]	110.2	110.3	110.0
Commodities Other than Farm & Foods[7]	115.5	115.5	114.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.



Sure we've been making stampings for 40 years! . . . But we're going up the hill faster than ever!

Expanded facilities! . . . Newer equipment! . . . Wider diversification! . . . Even more customers—and from every major industry!

The mere fact that we're the nation's best-known job stamping manufacturer . . . shows how we've progressed.

Now . . . as our life steps up at 40 . . . would be a good time to let us do a bang-up job for you, too!

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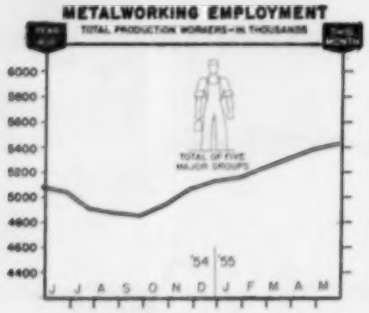
359 Midland Ave., Detroit 3, Mich.
America's Best-Known Job Stamping Manufacturer

THE BUSINESS TREND

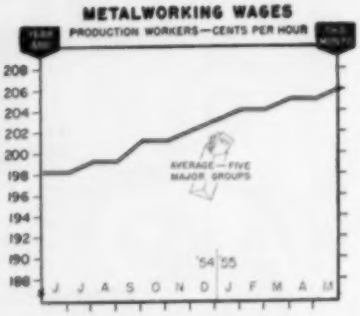
METALWORKING EMPLOYMENT
TOTAL PRODUCTION WORKERS—IN THOUSANDS



1954	Prim. Mtls.	Fab. Prod.	Mach. inery	Elec. Mchy.	Trans. Equip.
May	974	832	1,170	776	1,346
June	982	831	1,154	761	1,328
July	969	809	1,111	751	1,279
Aug.	967	820	1,095	766	1,238
Sept.	965	821	1,097	785	1,183
Oct.	969	829	1,093	800	1,249
Nov.	993	844	1,092	811	1,334
Dec.	1,002	843	1,106	809	1,375
1955					
Jan.	1,013	834	1,100	800	1,400
Feb.	1,032	844	1,125	803	1,426
Mar.	1,037	860	1,144	803	1,447
Apr.*	1,060	871	1,165	806	1,467
May*	1,099	876	1,171	812	1,466

*Preliminary.
U. S. Bureau of Labor Statistics.
Charts copyrighted, 1955, STEEL.

METALWORKING WAGES
PRODUCTION WORKERS—CENTS PER HOUR



1954	Prim. Mtls.	Fab. Prod.	Mach. inery	Elec. Mchy.	Trans. Equip.
May	207	189	201	181	211
June	208	189	200	182	212
July	211	189	201	182	212
Aug.	210	190	201	181	213
Sept.	214	191	203	182	216
Oct.	213	193	203	184	216
Nov.	214	193	203	184	218
Dec.	214	194	204	184	219
1955					
Jan.	216	195	203	185	220
Feb.	215	195	204	185	220
Mar.	216	195	205	185	221
Apr.*	217	195	206	186	220
May*	218	196	207	187	222

*Preliminary.
U. S. Bureau of Labor Statistics.

summer is the virtual certainty of bigger price tags on 1956 models due to new auto labor contracts and higher prices expected for raw material, especially steel.

Another factor bolstering optimism is that June production was off from the planned goal of 728,000. Labor troubles and cutbacks among the Little Three account for the dip. Some of the production losses may be made up in the third quarter. Pointing in that direction is Ford, back in record-busting production now that labor negotiations are over.

Electronics Sales Sparkle . . .

The electronics industry is having an excellent year, says Glen McDaniel, president, Radio-Electronics-Television Manufacturers Association.

Over the past year, television set production hit a new record, and sales closely paralleled output. Radio sales have been good and show signs of getting better; production is well ahead of last year's.

Industry-wide, military procurement of electronic equipment and components remains high, and all indications are that it will stay that way. The current rate of production is about $2.25 billion, nearly 10 per cent below last year's output.

Rainbow's Pot of Gold . . .

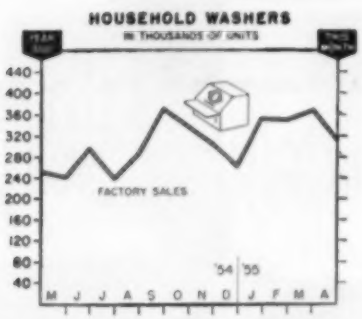
Color television failed to reach even the conservative forecasts of production and sales, but some manufacturers see a "definite forward movement" in the fall. When it comes, the industry looks for another boom that will overshadow the early days of black and white TV. The time schedule is still in doubt. Meanwhile, the black and white market remains good.

For the first time, radio-TV set servicing outpaced production. Over the last 12 months set owners paid out over $1.5 billion for service; dollar value of consumer TV and radio production was about $1.3 billion.

Output Hits New High . . .

Industrial production was at an all-time peak of 138 in May. The nation's output rose two points on the Federal Reserve Board's industrial production index to pass up the old mark of 137 set in May and July, 1953.

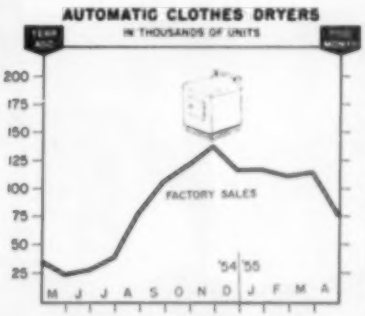
Durable goods continued to gain, but still are below their peak of



Factory Sales—Units

	1955	1954	1953
Jan.	357,354	249,956	277,309
Feb.	353,214	295,171	326,604
Mar.	370,555	307,862	345,989
Apr.	313,461	258,712	288,474
May	.....	246,944	286,515
June	.....	303,455	304,086
July	.....	242,863	228,268
Aug.	.....	293,243	291,260
Sept.	.....	379,666	340,532
Oct.	.....	339,169	310,867
Nov.	.....	308,368	238,153
Dec.	.....	264,803	191,570
Totals	.....	3,490,212	3,429,627

American Home Laundry Mfrs. Assn.



Factory Sales—Units

	1955	1954	1953
Jan.	115,383	83,195	62,260
Feb.	109,215	62,455	57,126
Mar.	113,498	54,796	49,593
Apr.	73,978	37,661	28,556
May	.....	26,533	32,567
June	.....	30,297	32,789
July	.....	40,755	33,296
Aug.	.....	80,165	70,774
Sept.	.....	107,054	86,451
Oct.	.....	122,182	81,839
Nov.	.....	138,254	78,167
Dec.	.....	115,341	82,730
Totals	.....	897,751	696,468

American Home Laundry Mfrs. Assn.

mid-1953. Nondurable output was at a new high, about 2 per cent above the level of two years ago.

The increase in durable goods reflects continued gains in producers' equipment, household goods, metals and building materials. Record steel production and auto assembly also were important factors. Some dip will likely show up for June because of the slowdown in auto assemblies during labor negotiations.

Hiring's on the Upswing . . .

Rising employment is accompanying higher production. The Labor department's latest surveys indicate the current increase is going to continue. Key employers in the major production and employment centers report they will need additional workers till mid-July to meet schedules.

Seasonal gains in construction, trade and other nonmanufacturing activities, plus a continuing upturn in factory payrolls, have combined to reduce jobless totals in more than 130 employment areas since early spring. Unemployment insurance records indicate sharp drops in joblessness in about half the areas.

As a result, eight major areas were removed from the labor surplus categories entitled to special treatment for defense procurement and tax amortization.

Trends Fore and Aft . . .

Business activity for the second half after allowance for the usual summer dullness in certain industries will be moderately higher than for first half, but the rate of gain will be slower and more irregular than it has been, forecasts the Cleveland Trust Co. . . . New orders for freight cars in May showed an increase for the second consecutive month, reports the American Railway Car Institute. Ordered were 3041 cars, compared with only 1071 in May, 1954 . . . New business incorporations continue at a record pace—12,029 in May—says Dun & Bradstreet Inc. On the other hand, failures are also up, to 955—second highest in 12 months and highest for May since 1942. Liabilities, though, are down 3 per cent to the lowest point in seven months . . . Housing starts made a seasonal advance last month to 132,000, up 12 per cent from last year's, notes the Labor department. Northeastern and Southern gains more than offset a drop in the West.

COOLIDGE
Balls

CHROME ALLOY AND STAINLESS

COOLIDGE CORPORATION
MIDDLETOWN, OHIO

baby doing nicely thank you!
FORGED ROLLS
The Ohio Steel Formula for Blue Ribbon Rolls
HARDNESS
STRENGTH
UNIFORMITY
CONSISTENCY
Ohio Rolls
SHAPING METAL FOR ALL INDUSTRY
THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO • Plants at Lima and Springfield, Ohio

SAMUEL M. FELTON
. . . heads American Car & Foundry

Samuel M. Felton was elected president, **American Car & Foundry Division**, ACF Industries Inc., New York. He was president of Shippers' Car Line Corp., an ACF subsidiary.

Leon B. Wohlgemuth was made sales manager-middle states for the tubular products division of **Babcock & Wilcox Co.** He continues offices in Chicago. He was Chicago district sales manager.

Marquard J. Anderson was named a vice president of **Aro Equipment Corp.**, Bryan, O. **Norman J. Sine** was made division manager for western Missouri, with headquarters in Kansas City, Mo. **J. R. Markey** was named a director.

R. L. Troxell was elected vice president of **American - Marietta Co.**, Chicago. Chief engineer since 1945, he continues as the administrative head of the firm's engineering department.

William A. Baldwin was appointed sales manager for nailable steel flooring and other transportation products of **Stran-Steel Corp.**, unit of National Steel Corp., Ecorse, Mich.

Frank Leahy was elected a vice president of **Merritt-Chapman & Scott Corp.**, New York. He was with Exothermic Alloys as executive vice president in charge of sales.

W. A. THOMAS
. . . Atlas Steels works mgr.

W. A. Thomas was appointed works manager at **Atlas Steels Ltd.**, Welland, Ont. He was plant superintendent and is replaced by **G. C. Olson**, former melting superintendent.

Harold Nutt was elected president and general manager of **Borg & Beck Division**, Borg-Warner Corp., Chicago. He was vice president-general manager. **T. L. Knecht**, former president, retired May 31. **Clyde Bissell** assumes the position of vice president, continuing as secretary, treasurer and controller. **Edward H. Lipke**, factory manager, was made a vice president.

Harold H. Hippler was made general sales manager, **Gar Wood Industries Inc.**, Wayne, Mich.

Frank H. Lamson-Scribner was appointed executive associate to the president of **Onsrud Machine Works Inc.**, Chicago.

Henry H. Lentzer was elected vice president-manufacturing, **Kearney & Trecker Corp.**, Milwaukee. He succeeds **Ralph W. Burk**, now executive vice president. Mr. Lentzer was manager of the special machinery division. **Renald F. Zemke**, former manager, process engineering department, was made works manager of the standard machine division. **John Bunce** was named staff assistant to Mr. Lentzer.

CLINTON T. COOPER
. . . Signal-U Mfg. executive v. p.

Clinton T. Cooper was elected executive vice president of **Signal-U Mfg. Co.**, Canfield, O.

Harold Ruehl was made assistant chief engineer by **Erickson Tool Co.**, Cleveland. He was chief tool engineer, industrial power division, International Harvester Co.

Edward W. Cooper was promoted to eastern sales manager, special products division, **United States Pipe & Foundry Co.** He is at Burlington, N. J.

Robert C. Verhaeghe was named chief engineer, automotive division, **Modine Mfg. Co.**, Racine, Wis.

Frank Machac was made superintendent of the Des Plaines, Ill., plant of **Shakeproof Division**, Illinois Tool Works. He was superintendent of tools.

Felix A. Chardon was named manager of aircraft quality control for **Kaiser Metal Products Inc.**, Bristol, Pa.

F. A. Monahan was appointed manufacturing and development co-ordinator for **Convair Division**, General Dynamics Corp., San Diego, Calif.

Donald E. Moat was made assistant director of marketing, **Leeds & Northrup Co.**, Philadelphia. He was Cleveland district sales man-

RICHARD J. SWAN

MILTON M. FENNER JR.

. . . Allegheny Ludlum Steel sales appointments

ager. Mr. Moat will be acting head of the marketing department, succeeding the late **L. E. Emerich.**

Allegheny Ludlum Steel Corp., Pittsburgh, made **Richard J. Swan** director of sales, magnetic and electronic materials; and **Milton M. Fenner Jr.** director of sales, tool and die steels. Succeeding Mr. Swan at Los Angeles as Pacific Coast area manager is **Karl A. Elers. Irving R. Leheney** succeeds Mr. Fenner as tool steel product manager. **John B. Henry Jr.** was made acting manager of application development.

Kenneth L. Austin was named manager, Southwestern office, **ElectroData Corp.** He has headquarters in Dallas.

George F. Powell was made manager of **Delta Power Tools'** newly enlarged government sales department, Rockwell Mfg. Co.

Ernie E. Antus was elected treasurer of **Rolled Steel Products Corp.,** Skokie, Ill.

Breuer Electric Mfg. Co. appointed **William R. McMillen** regional sales manager in the Southeast. He has headquarters in Atlanta.

In the Chicago sales offices of **Youngstown Sheet & Tube Co., Ralph W. Mowry** was named manager of western sheet sales and **Philip H. Booth,** assistant manager of western bar sales. **M. S. Gettig** was made assistant general superintendent of the steel plant, Indiana Harbor Works, East Chicago, Ind.; **R. V. Cordingley,** assistant general superintendent, strip and tin plate plant; and **Earl W. Mahaney,** assistant superintendent of the metallurgical department in the Chicago district.

William H. Bennett was made vice president-sales and **J. W. Arnold** vice president-manufacturing at **Hydraulic Press Mfg. Co.,** Mt. Gilead, O. Mr. Bennett returns to HPM after six months as sales manager at Lake Erie Engineering Corp. Mr. Arnold was general manager of Erie Engine & Mfg. Co. Other HPM appointments: **Robert J. Lindsey,** made director of engineering; **Glen R. Pittman,** sales manager, hydraulic power division; and **William N. Woodward,** secretary-treasurer.

William P. Drake, executive vice president, succeeds **George B. Beitzel** as president of **Pennsylvania Salt Mfg. Co.,** Philadelphia. Mr. Beitzel continues as a director and will serve as chairman of Pennsalt International Corp., a subsidiary.

Robert G. Shrake was made assistant district sales manager in Cincinnati for **Republic Steel Corp.**

Albert E. Amorosi was made chief chemist with **Alox Corp.,** Niagara Falls, N. Y.

J. B. Kelly was made executive vice president, **McCloskey Co.,** Pittsburgh.

C. Roger Sutton joined **International Nickel Co. Inc.,** New York, as a member of its stainless steel and heat resistant alloys section, development and research division. He was senior metallurgist at the Argonne National Laboratory, U. S. Atomic Energy Commission.

John I. Farrell was made assistant sales manager, **A. M. Castle & Co.,** Chicago.

Thomas E. Williams, superintendent of the Los Angeles steel service plant of **Joseph T. Ryerson &**

WILLIAM H. BENNETT

J. W. ARNOLD

. . . Hydraulic Press Mfg. vice presidents

SUPERIOR TUBING acts as a temperature and mechanical handling shield for delicate sub-surface, radioactive logging instruments.

SMOOTH SURFACES, CLOSE TOLERANCES, LIGHT WEIGHT: REASONS WHY SUPERIOR TUBING IS USED TO HOUSE THESE DELICATE WELL SURVEYING INSTRUMENTS

Well Surveys of Tulsa, Okla., purchases Superior Seamless Type 304 Stainless Tubing in large OD, light wall sizes and in 63 in. lengths. Into these tubes, which in the finished state vary from 28 to 31 in., radioactive well-logging instruments are inserted—instruments so delicate that stray electrical waves or gases leaking into the casing may throw them off.

For that reason, the tubing is supplied in the "as drawn" condition, with a smooth surface that has a high radiation factor. Stainless is specified because plated material used in the past flaked off and short-circuited the instruments. The thin wall size (2.098" x .018" wall) is important; first, because of weight and, second, because of the close fit demanded. After the instruments are inserted, the tubing—closed by spinning—goes into an outer housing which must withstand pressures of 20,000 psi.

Whatever you want tubing for—an instrument housing, hypodermic needle, radio antenna, or heat exchanger—you'll find that the high quality of Superior tubing saves you time, money and production headaches. Send for your free copy of Bulletin 40—*A Guide to the Selection and Application of Superior Tubing*. SUPERIOR TUBE COMPANY, 2005 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif.

PRE-TESTING an assembly before it is inserted into the Superior tube

Superior Tube

The big name in small tubing

All analyses .010" to ½" OD
Certain analyses in light walls up to 2½" OD

F. P. VON MEYER
. . . Anderson Co. production mgr.

D. B. WIESLEY
. . . Continental Can official

W. HARRY WALLACE
. . . Rodney Hunt Machine plant mgr.

Son Inc., takes on additional duties as general superintendent of West Coast plants.

F. P. von Meyer was made production manager, manufacturing division, **W. H. Anderson Co. Inc.**, Detroit. He served for the last four years as production manager, bearing division, Bohn Aluminum & Brass Corp.

Helical Tube Corp., Grand Rapids, Mich., appointed **Charles Tamburello** eastern district sales manager.

Norman W. Jensen was appointed sales manager, mill products division, **Kawneer Co.**, Joliet, Ill.

Cooper-Bessemer Corp. promoted **G. W. Edick** to branch manager of compressor and stationary engine sales in New York.

D. B. Wiesley was made general manager of production engineering for the metal division of **Continental Can Co.**, New York.

B. A. Daley, chief metallurgist, succeeds **A. C. Shuart**, resigned, as chief engineer of the defense division of **Servel Inc.**, Evansville, Ind.

G. Allen Lovell was elected a vice president, **United States Rubber Co.**, New York, and made general manager of its mechanical goods division.

Louis Greenfield was appointed product manager of **Proto Tools**, Los Angeles.

Dr. Harris M. Sullivan was named manager of the electronics laboratory of **General Electric Co.** at Syracuse, N. Y.

W. Harry Wallace was made plant manager of **Rodney Hunt Machine Co.**, Orange, Mass. He was works manager at Bagley & Sewall Corp.

Crucible Steel Co. of America appointed **J. D. Dickerson** to the staff of the central operating department, Pittsburgh. He is succeeded as chief metallurgist at the Midland, Pa., Works by **C. S. Walton.**

George C. Betz was made sales manager, chemical and metals department, **Metal & Thermit Corp.**, New York.

Thomas L. Humble was elected vice president and general manager in charge of production at **Aluminum Industries Inc.**, Cincinnati. He was with Chrysler Corp. as a member of the vice president's staff of Plymouth.

OBITUARIES . . .

A. L. Bushman, 57, assistant manager, New York office, **Crucible Steel Co. of America**, died June 10.

Patrick H. McCarthy, 86, founder, **Vulcan Stamping & Mfg. Co.**, Bellwood, Ill., and **Vulcan Tin Can Co.**, died June 10.

Claude S. Holst, 39, production manager, **Cherry-Burrell Co.**, Milwaukee, died June 12.

Rudyard Porter, 61, metallurgical engineer, **United States Steel Corp.**, Chicago, died May 29.

George S. Sangdahl, 66, manager, Pittsburgh division, **Chicago Bridge & Iron Co.**, and a vice president of the firm, died June 14.

George M. Carvlin, 55, vice president and general manager, engineering and construction division, **Koppers Co. Inc.**, Pittsburgh, died June 12.

John F. Barnes, 52, senior research engineer, **Carborundum Co.**, Niagara Falls, N. Y., died June 9.

Bernard L. Dreyer, 64, chief engineer of **Rolphs-Dygen Corp.**, San Diego, Calif., died June 1.

Howard S. Hatch, 58, secretary-treasurer, **Durabilt Mfg. Co.**, Aurora, Ill., died June 10.

Rhodes D. Swinburne, 57, comptroller, **Wheeling Steel Corp.**, Wheeling, W. Va., died June 16.

Charles A. Pratt, 86, vice president, **Goodman Mfg. Co.**, Chicago, died June 15.

'round the clock with

CF&I-WICKWIRE WIRE

In this advertisement we continue to take you through a typical day in the life of John Q. Citizen...showing you the part CF&I-Wickwire Wire plays in his everyday activities.

OFFICE BUILDING—8:55A.M. John never stops to think about it but he rides up to work on dependable elevator cable. Without this indispensable wire product—much of it made of CF&I-Wickwire Wire—modern multi-story buildings would be unable to function.

OFFICE—9:00 A.M. Here we are, inside John's office. Where is the wire? All around us. Paper clips inside the desks. Springs inside the telephones and the typewriters—even under John's swivel chair. Staples, coat hangers, ring binders—these and countless other office necessities are made from wire—very often of CF&I-Wickwire Wire.

FACTORY—3:00 P.M. Let's accompany John on a trip to his firm's nearby factory. The premises are inclosed by a wire fence. Inside, we find wire mesh cloth used as machinery guards. Metal processing belts made of woven wire. Springs of every variety to keep the machines going. All of these products use CF&I-Wickwire Wire.

Watch for the balance of John's day **in our next advertisement which takes John back to his home and the relaxation of his living room.**

For the Wire You Require — Check CF&I-Wickwire

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

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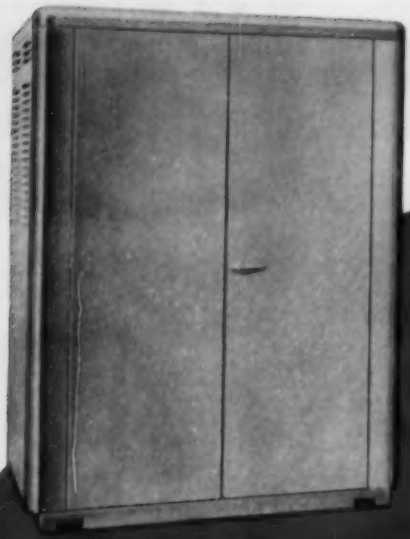
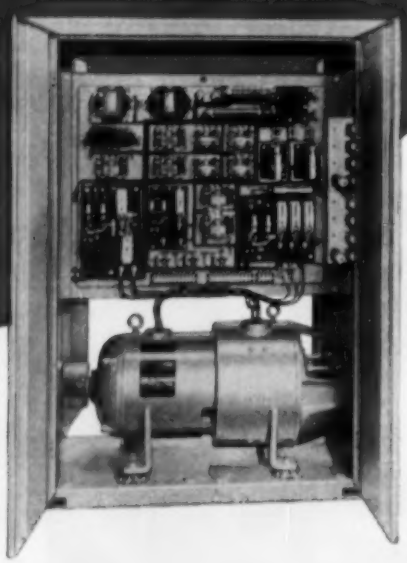


This neat control cabinet houses the a-c to d-c power conversion unit, plus the control required for the particular application. The cabinet is pressurized to prevent entrance of dirt, dust, etc.

Providing d-c motor performance from a-c power supply...

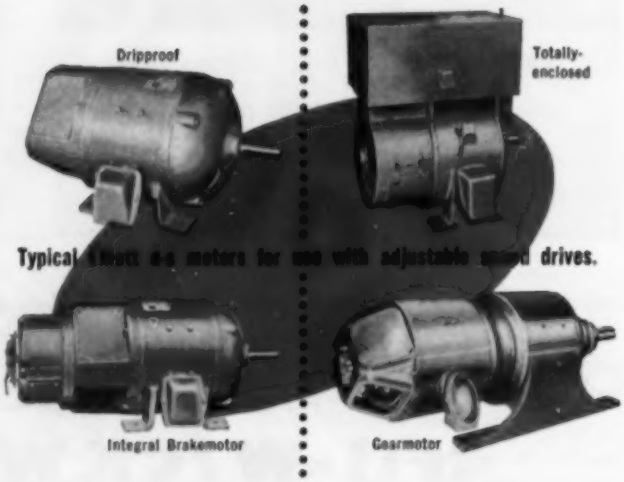
ELLIOTT C-W *Packaged* Adjustable-Speed Drives Type VV



A special 15-hp power package designed for voltage regulated multimotor drive. It provides complete control and supervision of drives from a remote operator's panel.

THESE PRE-ASSEMBLED, pre-wired power packages offer simple, convenient speed adjustment without intermediate speed changing or line-shafting. In addition to starting, speed adjustment and positive stopping controls, the units can easily be modified for special operations. To name a few: reversing, jogging, creep speeds, dynamic braking, preset speed, multimotor drive, etc.

Elliott adjustable-speed drives are designed for ratings to 200 hp—speed ranges to 16:1 and up for 208, 220, 440 or 550 volts—25, 50 or 60 cycles, 2 or 3 phase. All power package components are backed by the Elliott Company's more than half-century of experience in the manufacture and application of industrial drives. For a simple and positive solution to any drive problem, call your local Elliott representative or write to Elliott Company, Crocker-Wheeler Division, Jeannette, Pa.



Typical Elliott a-c motors for use with adjustable speed drives.

ELLIOTT Company

WB-6

Bar Mill for New England

Birdsboro Steel Foundry & Machine to build facility for Northeastern Steel at Bridgeport

NORTHEASTERN STEEL Corp., Bridgeport, Conn., has placed a $2-million contract with Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., for the manufacture of a merchant bar mill.

Designed for the production of high-grade alloy and stainless steel bars, as well as the usual carbon grades, the mill will be in operation early in 1956, says E. A. Schwartz, president of Northeastern.

Diversification—"Addition of the new bar mill, together with the new electric furnaces (STEEL, Apr. 18, p. 81), will increase our over-all capacity to 300,000 tons of ingots annually, and will diversify our product line," Mr. Schwartz said, adding:

"The excellent design of the new mill will make possible a high-quality product and will provide a flexibility of operation enabling Northeastern to meet the requirements of the aircraft, bearing, machine tool and other industries in the New England area."

Birdsboro's engineers are completing designs for the mill after six months of study with Northeastern engineers and plant executives. The Birdsboro firm makes steel mill machinery, hydraulic presses, steel castings and rolls, rock crushers and railroad equipment.

Highly Mechanized — The mill will require a minimum of manual effort. Electronic devices will control many of the operations, said G. Clymer Brooke, president of Birdsboro Steel Foundry & Machine Co.

Mr. Schwartz pointed to the new mill as "another step forward in Northeastern's expansion program." The company, incorporated last December, produces hot-rolled carbon and alloy strip steel. On completion of the full program, entailing an expenditure of more than $8 million, Northeastern will be producing hot-rolled and cold-finished bars in a complete range of carbon, alloy and stainless grades.

Work will be started soon on a 700-ft addition to a 200-ft building to house the mill on Northeastern's 40-acre site on Bridgeport's harbor.

Wolverine Tube Moves Branch

Calumet & Hecla Inc.'s Wolverine Tube Division opened new mill depot facilities and a branch office of the east central sales district at 8941 Schaefer Highway, Detroit. J. H. Smith, east central district sales manager, has been transferred to Detroit from Dayton, O. The division's sales offices in the Chicago area have been moved to 1580 Sherman Ave., Evanston, Ill.

New England Shipyards Expand

Shipyard expansion plans in New England include a $1-million, 525-ft structural assembly plant at Bath Iron Works, Bath, Me.; and a $1-million research center at Electric Boat Division, General Dynamics Corp., Groton, Conn.

Bethlehem Opens Office

Bethlehem Pacific Coast Steel Corp. opened a sales office in Phoenix, Ariz. T. E. Neff is in charge of the office.

Superior Extends Holdings

Superior Tube Co., Norristown, Pa., acquired a majority interest in Johnson & Hoffman Mfg. Corp., Mineola, Long Island, N. Y., manufacturer of precision stampings and deep-drawn parts, primarily for the electronics industry.

Twin Coach Buys Engine Line

Twin Coach Co., Kent, O., purchased manufacturing and sales rights to Aerojet marine engines from Aerojet-General Corp., a Cincinnati subsidiary of General Tire & Rubber Co., Akron. The transaction was announced by Fageol Products Co., a wholly owned engine-building subsidiary of Twin Coach, through which the deal was made. Production of Aerojet engines is being moved to the Fageol Products plant.

Jones & Lamson Diversifies

Jones & Lamson Machine Co., Springfield, Vt., purchased Shopmaster Inc., Minneapolis, manufacturer of power tools for the home workshop. This is the first move in a program of diversification. Newly elected officers of Shop-

Aluminum Foil "Supports" 60,000-ton Carrier

The U.S.S. Ranger is resting on keel blocks covered with Reynolds Wrap of the same thickness (0.002-in.) used for many kitchen chores. This novel application of foil is preventing a great deal of moisture absorption by the wooden blocks and also is assisting in protecting the *Ranger's* steel hull while under construction by Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

ESCO
ALLOY 20
and 20 Cb
castings

to fight H_2SO_4
corrosion

Now you can specify *ESCO* Alloy 20 and 20Cb stabilized castings in wall thicknesses and dimensions to meet your most exacting requirements. Static, Spuncast® and Shellcast facilities are available as needed.

THE TOUGHEST CORROSION PROBLEMS WIND UP AT . . .

***ESCO* Alloy 20 and 20 Cb Cast Fittings are available from stock.** See your *ESCO* distributor, or write direct.

ESCO
HIGH ALLOY DIVISION

ELECTRIC STEEL FOUNDRY CO.

Manufacturing Plants
2160 N. W. 25th Ave.
Portland 10, Oregon
712 Porter St.
Danville, Illinois

ESCO International — **New York Office** at 420 Lexington Ave., New York City, or Portland Manufacturing Plant

Other Offices and Warehouses
Los Angeles,
San Francisco, Calif.
Seattle, Spokane, Wash.
Houston, Texas
Eugene, Oregon
Salt Lake City, Utah
Honolulu, Hawaii
in Canada: Vancouver, British Columbia and Toronto, Ontario.

master are: H. L. Andrews, president; L. H. Miller, vice president and general manager; E. R. Koester, vice president in charge of manufacturing; H. H. Whitmore, treasurer; N. T. Harrison, secretary-controller.

Herman Born Builds Plant

Herman Born & Sons Inc., Baltimore, maker of truck bodies, fire ladders, utility trailers, and other products is erecting a 20,000-sq-ft plant at North Point and Rolling Mill roads, that city.

Clevite Buys Eastern Firm

Clevite Corp., Cleveland, is purchasing Wallace Aviation Corp., maker of jet compressor blades, Wallingford, Conn. It will be operated by Clevite's largest operating unit, Cleveland Graphite Bronze Co., Cleveland. Wallace Aviation will continue to operate under its present name and in its present location at Wallingford.

Ohio Ferro Alloys Expands

An expansion program, costing well over $1 million, is nearing completion at Ohio Ferro Alloys Corp.'s Ohio plants. A large electric furnace was placed in operation June 9 at the Philo, O., plant. Another furnace of similar capacity will be ready to be turned on within a few weeks. These furnaces will expand the plant's capacity by about 40 per cent and are housed in a recently completed furnace building. The new plant is a complete plant built near the original Philo plant, which has been modernized and expanded many times since its erection in 1929.

The Canton, O., firm recently completed an expansion of its Brilliant, O., plant. A new furnace was put into operation and a 100-ft extension was added to the furnace building. The company also operates a ferroalloy plant at Tacoma, Wash.

Equipment Makers Unite

Colson Corp., Elyria, O., has become a wholly owned subsidiary of Great Ame .can Industries Inc., Meriden, Conn., through an exchange of stock. Colson, a mate-

Ansul Dry Chemical Piped Systems Now U.L. Approved For Industry-wide Use

For the first time, Automatic Dry Chemical fire protection for class B and C hazards

The science of fire protection took a big step forward when Ansul's *Dry Chemical Piped System* was approved by Underwriters' Laboratories. Eight years of development and field application made this important approval possible.

Ansul's Dry Chemical Piped Systems provide instant, around-the-clock protection for such hazards as paint dip tanks, spray booths, generators, flammable liquid pumping stations, exhaust ducts—wherever there is a hard to reach or highly flammable stationary installation.

Automatic or manual systems, or a combination of both, are available. Also, by using automatic selector valves, one piped system can protect two or more separate hazards.

Protecting a hazard with an Ansul Dry Chemical Piped System will, in most cases, result in increased insurance savings. Protect your business, safeguard your investment, get in touch with your Ansul Man today.

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Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-134, Marinette, Wisconsin. *Write Ansul for your copy of new Fire Equipment Catalog.*

ANSUL

- **G-32 FOR TEMPERATURES TO 3200° F.**
  The only insulating firebrick on the market designed for such high temperature service.
- **G-30 FOR TEMPERATURES TO 3000° F.**
  A *true* 3000° F. insulating firebrick . . . precise data recorded in actual service proves it to be the outstanding brick of its type.
- **G-28 FOR TEMPERATURES TO 2800° F.**
  Can be used in place of normal fire-clay brick with tremendous savings in weight and fuel costs.
- **G-26 FOR TEMPERATURES TO 2600° F.**
  In many furnaces where the temperature does not exceed 2600° F., G-26 can be used in place of fire-clay brick.
- **G-23 FOR TEMPERATURES TO 2300° F.**
  Unexcelled for use in heat treating and annealing furnaces in which the temperature does not exceed 2300° F.
- **G-20 FOR TEMPERATURES TO 2000° F.**
  Designed primarily as a high temperature backing-up insulation, G-20 can also be used in direct contact with flame and furnace gases.

For additional information call your local A. P. Green distributor . . . he's listed in the yellow pages of your telephone directory, or write

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ONE DEPENDABLE SOURCE OF SUPPLY FOR A COMPLETE LINE OF INSULATING FIREBRICK TO 3200° F.

A. P. Green Fire Brick Company offers you one source of supply for insulating firebrick for all temperatures from 2000° F. to 3200° F. All A. P. Green insulating firebrick have high insulating value, structural strength and the ability to withstand high temperatures without shrinkage. They are ground to accurate dimensions after firing and are available, in stock, in all standard nine inch series shapes. Information on special shapes and sizes furnished on request.

• distributors in the principal cities of the world.

rials handling manufacturer, will maintain its corporate identity. Great American makes cellular rubber and plastic products in its Rubatex Division, Bedford, Va. Its wholly owned subsidiary, Connecticut Telephone & Electric Corp., Meriden, produces communication and electrical equipment.

Schaefer Builds Plant

Schaefer Inc., Minneapolis, manufacturer of commercial ice cream cabinets, is constructing a 27,000-sq-ft assembly plant near Aberdeen, Md. Fabrication of the cabinets will be done by Harford Metal Products Co., Aberdeen.

Oster To Centralize Work

Oster Mfg. Co., producer of pipe and bolt threading machines, will centralize operations by moving its main plant and office to Wickliffe, O. Occupancy is scheduled for September.

Sylvania Enlarges Laboratory

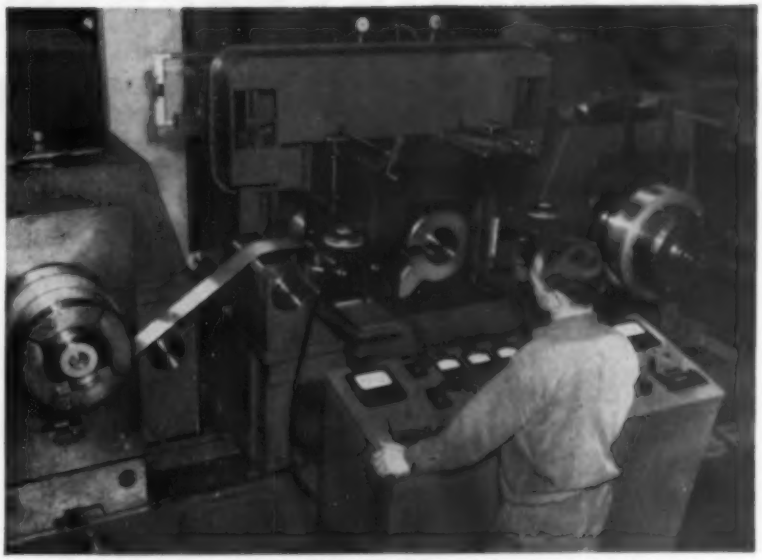
A 40,000-sq-ft wing will be added to Sylvania Electric Products Inc.'s new laboratory at Waltham, Mass. The addition is 50 per cent larger than originally planned. Construction of the main 80,000-sq-ft building began last October. On completion, Sylvania will move its missiles laboratory (now in Whitestone, N. Y.) to Waltham.

Lukens Forms New Division

Lukens Steel Co. has organized a Metallurgical Development Division. The move was prompted by the growing importance of the firm's steel plate specialties (which account for over 60 per cent of its annual sales volume) and expanded plant facilities. The new division will report to L. M. Curtiss, general works manager. T. T. Watson is manager of metallurgical development; J. G. Althouse, chief metallurgical engineer; S. D. Lemmon, metallurgical service engineer; H. A. Grubb, metallurgical plant engineer; P. R. Chandler, metallurgical engineer, processing.

Lukens Research Division is under the general supervision of G. D.

(*Please turn to page* 72)



TYPICAL OF NEW PRODUCTION EQUIPMENT installed in the Beryllium plant is this Sendzimir cold-rolling mill which handles wider strip faster than previous equipment, while its precision makes possible greater dimensional control and quality of product.

THE NEWS FROM BERYLLIUM IS EXPANSION

New production facilities improve quality, expand size, tighten tolerance range and increase availability of "Berylco" Beryllium Copper

The laboratory stage of beryllium lasted from its discovery in the 1790's until early in the 1930's. The last two decades might be termed the pilot stage, for the value of beryllium and its alloys, particularly beryllium copper, was being proved throughout industry. Indications from large-volume users are that a new era is on hand—the mass-production era. To make this possible, the world's largest producer, The Beryllium Corporation, has just completed a multimillion-dollar plant improvement program as part of an overall expansion plan.

This program encompasses the whole production set-up, from the ball mills that grind ore to the finishing mills. Cold-rolling capacity, for instance, has been multiplied by the installation of new strip mills. New finishing mills not only increase capacity, but make possible closer tolerances and new strip sizes. Sufficient economies have already been realized to warrant price reductions on strip in lighter gages to large volume users. A new extrusion mill supplements existing hot-rolling facilities and provides sizes, shapes and forms not produced heretofore. Thus beryllium copper is now being made available in greater quantities, more numerous forms, and improved quality.

Write for technical information, engineering help or free testing samples.

NEW MARKETING TECHNIQUES ALSO. Leading nonferrous distributors the country over are now carrying a wide stock of beryllium copper products, ready for immediate delivery. Write for the name of the distributor nearest you.

PRODUCT DIRECTORY. This 20-page booklet contains the most complete listing of beryllium alloys and forms available anywhere. Send for your free copy today.

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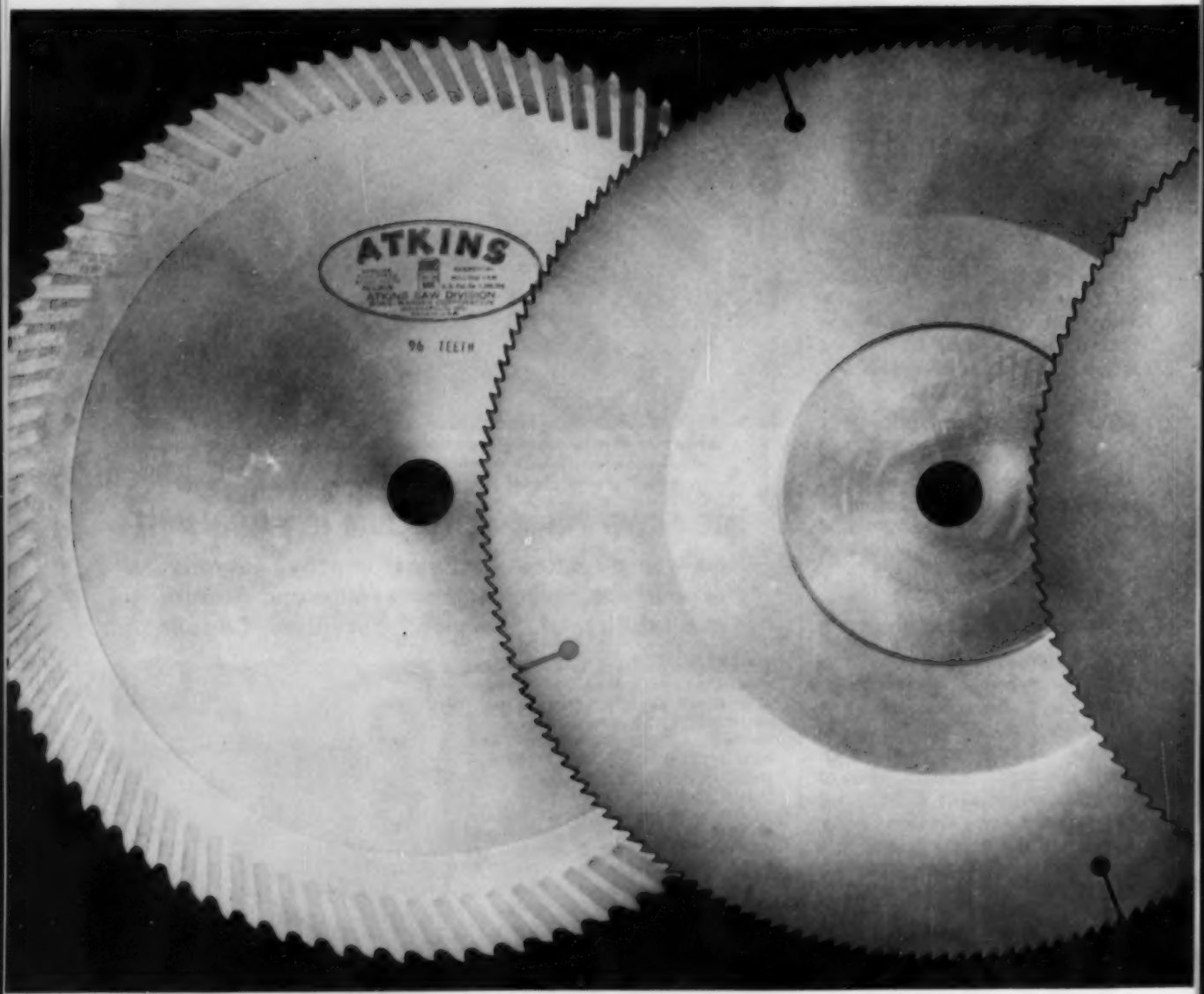
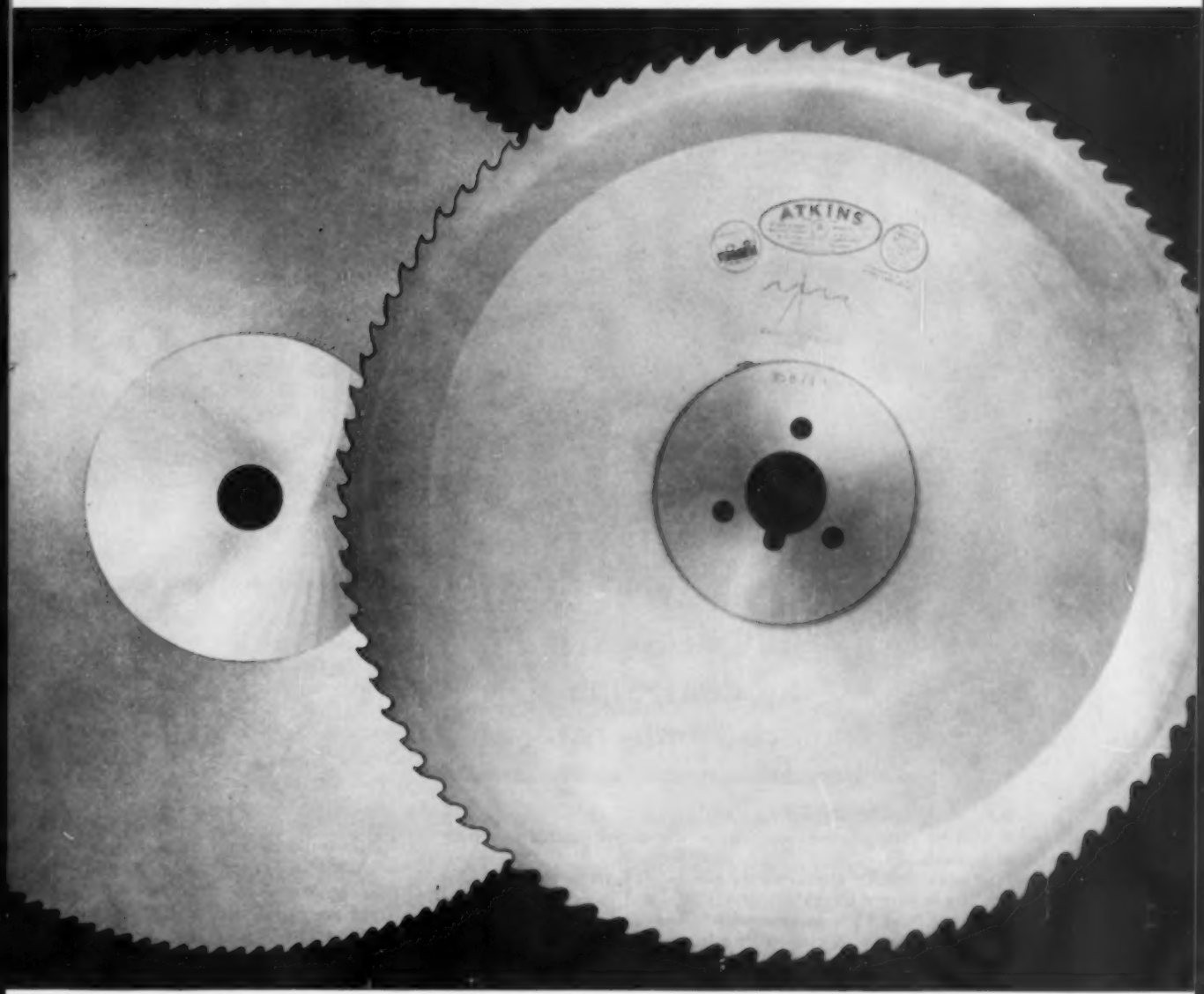


These are unretouched photographs.

. . . and somebody

DO THE TOUGH JOBS BETTER



always asks why!

● The answer is a simple one—each Atkins saw is specifically engineered for extreme accuracy on its own particular job.

Ask your Atkins distributor to have a factory product engineer check *your* circular metal saw operations and assist in the resulting recommendations that will save you time and money on every cut. Atkins is a reliable source for metal-cutting saws.

You can *depend upon your Industrial Distributor.*

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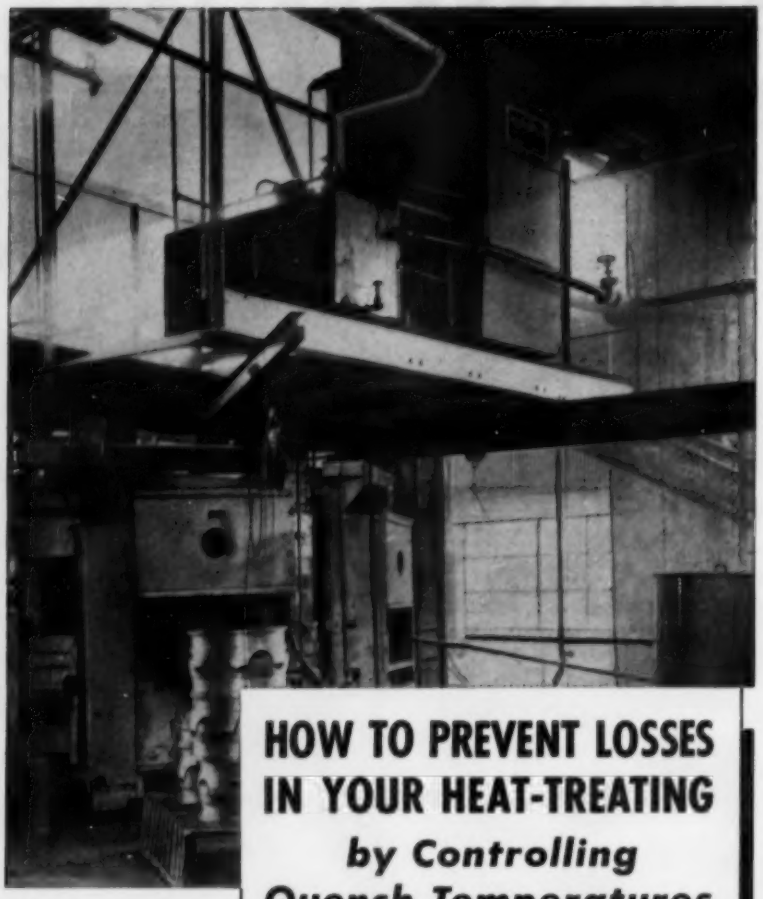
ATKINS Silver Steel SAWS

BW



HOW TO PREVENT LOSSES IN YOUR HEAT-TREATING
by Controlling Quench Temperatures

● Using Niagara's AERO HEAT EXCHANGER to cool your quench bath never fails to give you real control of the temperatures at which you wish to quench.

Your experience will be the same as others who have installed this method. You'll get better physicals; save losses and rejections; increase heat-treating capacity and production with lower costs. You can put back heat into the quench bath to prevent the losses of a "warm-up" period. You remove heat at the rate of input and prevent flash fires in oil quench baths.

You'll save space in your heat treating department and get a more productive arrangement because less room is needed for coolers and tanks. You'll find savings in piping, pumping and in the amounts of oil you will have to buy. And the saving in the cost of cooling water alone is enough to repay the cost of the Niagara Aero Heat Exchanger, usually in less than two years.

Write for Bulletin 120 and further information

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Niagara District Engineers in Principal Cities of U. S. and Canada

INDUSTRIAL COOLING HEATING • DRYING
NIAGARA
HUMIDIFYING • AIR ENGINEERING EQUIPMENT

(Concluded from page 69)

Spackman, vice president in charge of operations and acting director of research; it's under the immediate supervision of the assistant director of research, E. M. Smith.

Canmaker Enlarges Plant

Independent Can Co., manufacturer of tin containers, is erecting a 7000-sq-ft addition. It will bring the company's total space to 45,000 sq ft at Baltimore.

Continental Can Buys Firm

Continental Can Co., New York, purchased the patents and production facilities of Vaporized Metal Coatings Inc., Roosevelt, N. J. Vaporized Metal is engaged in the development of machinery and methods for the high-speed, continuous coating of metals and nonmetals in a vacuum.

Davison Chemical Expanding

Davison Chemical Co., division, W. R. Grace & Co., is erecting at its Curtis Bay, Md., plant a $4-million unit for the manufacture of petroleum cracking catalysts. It should be in operation within a year.

Houdaille Acquires Plants

Houdaille-Hershey Corp., Detroit, acquired a group of diversified plants owned by Frontier Industries Inc., Buffalo. Facilities will be realigned, and the combined operations have been charted into four groups under a new management structure. Heading these groups is Gerald C. Saltarelli, vice president in charge of operations. Group heads are: H. H. Roosa, vice president in charge of subsidiaries; F. A. Smith, vice president in charge of the automotive group; E. Glenn Gorman, head of the company's aviation plants and products; F. J. Schmidt, head of the Stone Products Division. Frontier properties include: Manzel Division, Buffalo Crushed Stone Corp., Fairmount Tool & Forging Inc.

G. B. Thurstone becomes plant manager of Manzel, producer of lubricating machinery; E. L. Spencer, manager of Fairmount's Cleveland plant; Col. H. H. Haas, vice

Bridgeport HIGH I.Q. Silicon Aluminum Bronze Rod

It machines 50% to 70% as fast as free-cutting brass . . . is 9% lighter, 50% stronger than half-hard Naval brass, has excellent corrosion resistance and a tensile strength of 85,000 psi when annealed.

You can profit by using Bridgeport Silicon Aluminum Bronze Rod for high-strength screw machine parts, marine and pole line hardware, valve stems and pump parts, nuts and bolts. Free machining means faster production, longer tool life. High strength means superior wear, top performance.

We'd like to put these advantages to work for you. Our representative will be glad to show you how the *High Inner Quality* of Bridgeport Silicon Aluminum Bronze and other Bridgeport Alloys can help you to product improvement.

BRIDGEPORT BRASS

Offices in Principal Cities • Conveniently Located Warehouses

Bridgeport Brass Company, Bridgeport 2, Connecticut • In Canada: Noranda Copper and Brass Limited, Montreal

president of Buffalo Crushed Stone Corp.

Another step in Houdaille's diversification program is the establishment of an engineering laboratory in Pasadena, Calif., under the management of R. D. Fagely, the company's manufacturing engineer. Clarence S. Sorensen has been appointed consulting engineer.

Erickson Buys Mandrel Firm

Erickson Tool Co., Cleveland, purchased the E. Westberg Corp., East Syracuse, N. Y., maker of expanding mandrels. Erickson will make the new line at its Cleveland plant.

Will Expand Baltimore Plant

American Radiator & Standard Sanitary Corp., Pittsburgh, manufacturer of enameled cast iron bath tubs, lavatories, sinks and other plumbing fixtures, has begun the second part of its two-year modernization and expansion program at Baltimore. This calls for the installation of new equipment for bath tub and small ware castings, new furnaces for enameling fixtures and an improved conveyor system. Already completed are a 150,000-sq-ft warehouse and a continuous smelter. A new boiler has been installed.

Installs Melting Furnace

Eastern Stainless Steel Corp., Baltimore, is installing a 20-ton electric arc melting furnace. It will increase Eastern's melting capacity by 50 per cent.

Armco Buys More Facilities

Armco Steel Corp., Middletown, O., purchased the Middletown facilities of Warren Steel Corp. The plant and office buildings contain about 40,000 sq ft of working space, and will be used to house Armco's expanding fabricating and warehousing operations.

Diecraft Inc. Expanding

Diecraft Inc., Baltimore, maker of precision parts and assemblies, metal stampings and other products, is building an addition containing several thousand square feet for its engineering department.

Simplex Wire Enlarges Plant

Simplex Wire & Cable Co. is constructing a 100,000-sq-ft addition to its Newington, N. H., plant. Estimated to cost $1 million, the building is the second added since the plant opened in October, 1953. Increased orders for submarine cable, including wire for the first transatlantic telephone cable to be laid this summer, make expansion necessary.

Automation Industries Builds

Automation Industries Inc. is erecting a 5000-sq-ft plant on Marble road, Cockeysville, Baltimore county, Maryland. The company plans the design and manufacture of automated systems for industry and special commercial products. Philip C. Feffer is president.

Clary Acquires Avron Corp.

Clary Corp., San Gabriel, Calif., purchased Avron Corp., Long Beach, Calif., maker of aircraft valves and pressure regulators. Clary has transferred all Avron production to its main factory and will operate the property as part of its Aircraft Division which also makes pulleys, universal joints and other precision-type components.

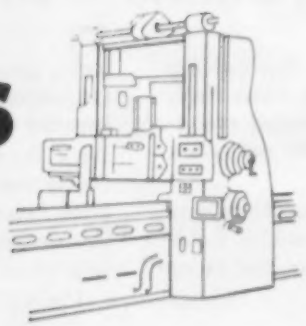
Shipbuilding Firm Renamed

Maryland Dry Dock Co., Baltimore, changed its name to Maryland Shipbuilding & Dry Dock Co.

Poor Organizes New Division

Poor & Co., Chicago, established a Crusher Engineering Division with headquarters in Philadelphia. It will make a complete line of jaw and roll crushers, hammermills, impact breakers, Bradford breakers and pulverizers. The line will include forgings and specially alloyed and manganese steel castings for the maintenance and repair of these related products. Design and engineering of the new products will be done in Philadelphia. Fabrication will be distributed among

LET SIMMONS REBUILD AND MODERNIZE YOUR PLANERS



Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1755 North Broadway, Albany 1, N. Y.

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Campbell Abrasive Cutters

CAMPBELL Abrasive Cutting is SMOOTH cutting —high quality at low cost

These CAMPBELL features will save you money

- **Eliminate annealing cost when cutting forged sections from bar lengths**
- **No added cost for smoothing operations**
- **Cutting accuracy reduces scrap losses**
- **Metal can be cut in practically any condition**

• Almost any type of material, whether hard or soft, can be economically cut by CAMPBELL Abrasive Cutters. The excellent finish obtained eliminates milling or other finishing operations in most cases.

Testing procedure by CAMPBELL Engineers will show conclusively which abrasive cutting machine will do the most economical job on your cutting application. Latest type CAMPBELL machines are available to save you time and money on every type of cutting operation.

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Use this Wetproof Dial Indicator wherever conditions are wet. It will give excellent performance and greatly cut maintenance costs.

AND NOW!

A WETPROOF DIAL INDICATOR

Completely Sealed — Wholly Protected from Coolant, Oil, Oil Fog, ("Smog?") and other Liquid Contaminants

IN ANSWER TO REPEATED REQUESTS from Dial Indicator users, Federal now announces this WETPROOF DIAL INDICATOR which eliminates maintenance troubles commonly encountered under the adverse operating conditions on machine tools. The W Series Dial Indicators are completely wetproofed and built unusually rugged to withstand heavy handling. THE CRYSTAL IS OF GLARE-PROOF GLASS which is remarkably free of halations and will not discolor when exposed to oil or other staining liquids. The dial is double, with a revolution counter optional. After setting the zero (0) by rotating in either direction, the dial can be clamped positively in position by tightening the retaining ring. The indicator spindle and stem bearing permit ranges up to .250". Made to AGD specifications (except for distance between bracket and end of contact point) in our regular "C" size (2¼") Indicator with Cushion Movement and certain modifications to improve performance. TRY THIS NEW INDICATOR ON YOUR WET JOBS. Write

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other divisions and subsidiaries of the parent company, including Kensington Steel Co., Chicago; Canton Forge & Axle Works Division, Canton, O.; Pioneer Engineering Works Inc., Minneapolis.

John Plimpton has been appointed vice president in charge of the new division; F. H. Neely, chief design engineer.

ASSOCIATIONS

E. C. Caluwaert of O. K. I. Welding Supply Co., Cincinnati, was elected president of the **National Welding Supply Association**, Philadelphia.

A. W. Soell, director of purchases of Gaylord Container Corp., St. Louis, was elected president of the **National Association of Purchasing Agents** for 1955-56.

W. S. Lowe, president of A. P. Green Fire Brick Co., Mexico, Mo., was elected president of the **Refractories Institute**, Pittsburgh. F. H. Laube, executive vice president of Freeport Brick Co., Freeport, Pa., was re-elected treasurer.

Byron B. Belden, Baldwin-Lima-Hamilton Corp., Philadelphia, was appointed chairman, Press Subcommittee, Fabricator's Division, **Metal Powder Association**, New York.

VACATIONS

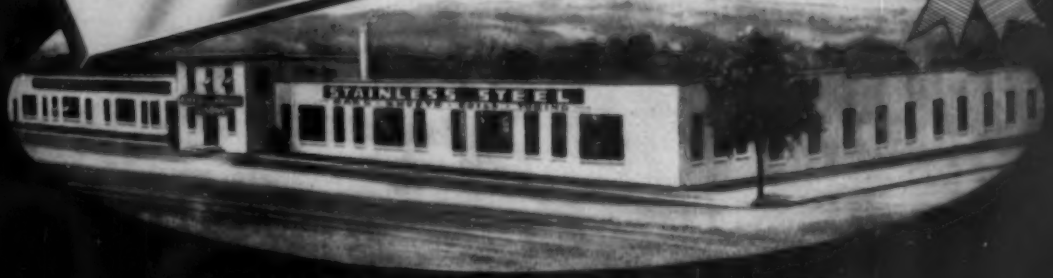
American Stamping Co., Euclid, O., will close its plant July 3-18 for vacations.

Warner & Swasey Co. will close its plants in Cleveland and New Philadelphia, O., Aug. 1-14 for vacations. No outgoing shipments will be made or deliveries received during the period.

Waldes Kohinoor Inc., Long Island City, N. Y., will be closed July 1-15, inclusive. It makes retaining rings, slide fasteners and other products. The firm's sales, order and shipping departments will function on a limited basis during the vacation period.

ULBRICH Stainless Steels

Certified ANALYSIS can be given on any Ulbrich material.



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STRIP • Flat Wire and other Stainless Steels
Converted to your closest requirements and
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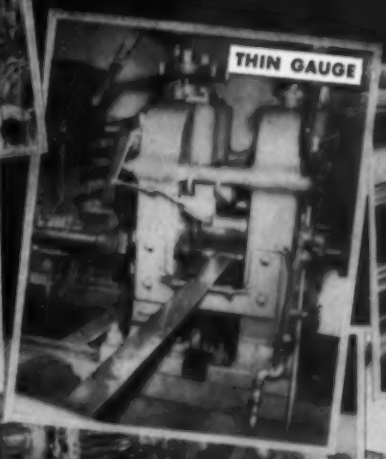

ULBRICH Stainless Steels

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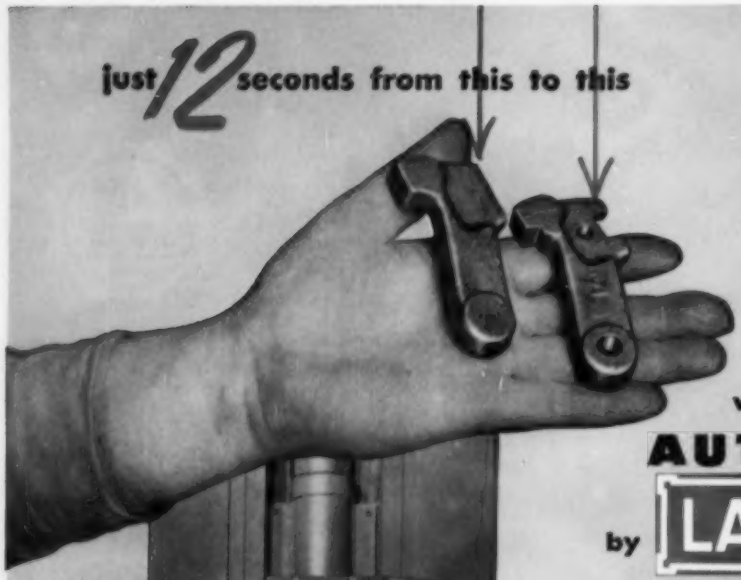

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AUTOMATION

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BROACHING

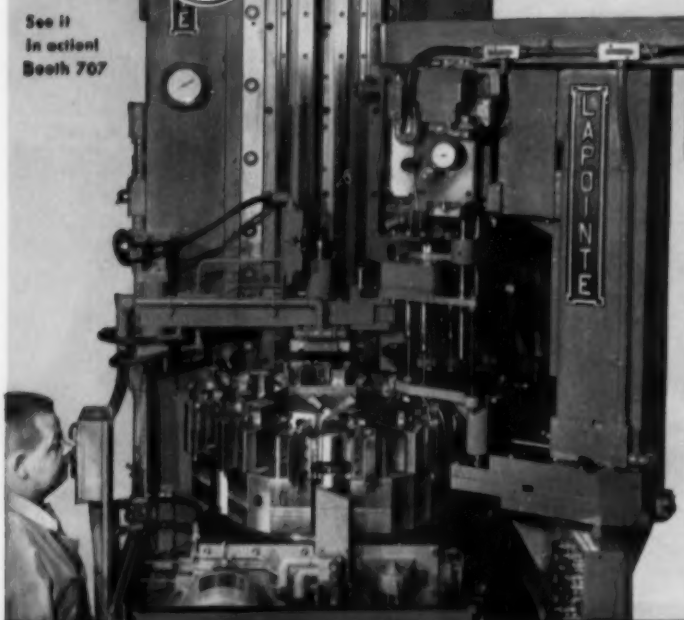
A PARKING BRAKE PAWL forging is straddle-broached to form a straight-sided tooth on one edge and a slot on the opposite side . . . and then 2 holes are drilled and reamed at close tolerances with relation to broached surfaces . . . at a production rate, for the finished part, of

300 PER HOUR

AT 80% EFFICIENCY!

THE MACHINE TOOL SHOW CHICAGO, ILL. SEPT. 8-17, 1958 INTERNATIONAL AMPHITHEATRE

See it in action! Booth 707



This Lapointe 10 ton, 54-inch stroke Single Ram Vertical Broaching Machine is equipped with an **automatic indexing fixture.** Parts are progressively moved in pairs through 6 double-stations, and the broaching, drilling, and reaming operations are done simultaneously but on separate pawls.

If you wish to know more about increasing your production through broaching,

write for our Bulletin SRV-3.

THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

In England: Watford, Hertfordshire

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

STEEL

June 27, 1955

Technical Outlook

SMALLER MOTORS—That's the promise of Westinghouse research men who have come up with an insulating enamel that can be in service continuously at 325° F for ten years. Combining the chemical and mechanical properties of modified polyester-type resin with the heat resistance of silicone can mean a 50 per cent reduction in insulation thickness. A 7½-hp motor no larger than today's 5-hp unit could be built.

PRESS FORGING URANIUM—It's being done for the first time by Heppenstall Co., Pittsburgh. Ingots are heated in a salt bath, forged on a 1000-ton press, then water quenched to prevent oxidation. Mallinckrodt Chemical Works, St. Louis, is the customer for whom the process is being researched.

MORE USES—Lower temperature porcelain enamels are just across the horizon. They will open up new vistas for products that cannot use this finish because of warpage and designs required to meet firing temperatures of 1500°F frits. These predictions were made by J. R. McCord, Ferro Corp., at a meeting of the Porcelain Enamel Institute in Chicago.

PINT-SIZED THERMOSTATS—One-fourth in. in diameter and less than 2½-in. long, they were developed by Fenwal Inc., Ashland, Mass. They're designed for use in heated equipment, bearings, pumps, etc.—and will either control heat or detect it.

FAST HEAT—This is what happens when a 300,000-lb airplane lands at 100 mph: Seconds after the brakes are applied the temperature at the point where brake lining rubs against the brake drum soars to over 2000°F. B. F. Goodrich scientists have developed an electronic device, known as an analog, which simulates this temperature rise. It supplies facts on heat flow characteristics of metals. Fed a problem on an aircraft design, it determines whether an experimental brake is practical or if the critical temperature will exceed material limitations.

BRIDGING THE GAP—For high strength conductor use, a new magnesium silicide alloy of aluminum drops into the slot between the mechanical properties of copper and the electrical conductivity of EC grade aluminum. It's the result of joint research by Revere Copper & Brass Inc. and Aluminum Co. of Canada. Its name: Revere alloy 6263.

MORE WELDING ELECTRODES—Eight new classes added to the specification on stainless steel electrodes by ASTM and AWS bring the total to 18. They are: Two extra low carbon grades (E308ELC, E316ELC); two columbium (E309Cb, E310Cb); two molybdenum (E309Mo, E310Mo); and grades E312, E318.

FILTER—Practically nothing sticks to it. It won't absorb moisture; it stands 400°F indefinitely; and boiling aqua regia and fuming sulphuric acid hold no terrors for it. This is the performance record for a tetrafluoroethylene (Teflon) fiber felt suggested for industrial filter use. You can get it in pilot plant quantities from Du Pont.

CHANGED VIEWPOINT—Pure chromium is a ductile metal, say researchers at Battelle Memorial Institute. By proper fabrication, iodide chromium sheet having an average ductile-to-brittle bend-transition temperature below 32°F is obtained. Small amounts of oxygen, nitrogen, iron, molybdenum, tungsten and silicon have little effect on the bend ductility of chromium. Nickel, carbon or sulphur cut down hot and cold ductility.

Metalworking Outlook—p. 31 *Market Outlook—p. 111*

Roughly 50 per cent of all machined parts are threaded. Yet, this one operation remains one of the most critical, and one of the machinist's problem jobs

By DALE BUTTOLPH
Sales Engineer
Warner & Swasey Co.
Cleveland

Tips on Thread Cutting

EVEN THOUGH the finest equipment is used, threading can be a problem.

The selection and use of proper equipment is part of the answer, but difficulties often can be attributed to failure to meet one or more other important requirements.

Handicap—A tap probably operates under the most adverse conditions of any cutting tool. To make matters worse, it often gets the least amount of consideration.

The cutting edge works where it is extremely tough for a coolant or lubricant to reach, causing it to dull rapidly. It is highly important that taps be ground frequently to insure clean accurate threads.

Die head chasers operate under slightly better cutting conditions. They, too, must be watched. When a slight amount of dulling is noticed, they should be reground.

Offhand Is Out—Accurate grinding of taps and chasers is of prime inportance for satisfactory performance and good tool life. They should always be sharpened by machine to obtain accuracy and uniformity of cutting faces and chamfers. Offhand grinding should be avoided when possible.

Consideration also should be given to the cutting face angle, since this varies somewhat with the material being threaded. Useful information on approximate face angles for various materials may be obtained from reference charts provided in most catalogs and manuals furnished by the tap and die head manufacturers.

Drilling—Proper preparation of the hole is the starting point. Drills should be sharp and ground evenly, preferably in a fixture or on a machine, rather than free hand. Coolant should be used for drilling, where practical, to prevent overheating and possible surface hardening of the metal in the area to be threaded.

Holes for taper threads should be taper reamed before tapping if possible. Every tooth on a taper tap cuts, subjecting the tap to extremely heavy loads. Taper reaming the hole reduces the load considerably, as each tooth is required to cut its full thread depth.

Slogan—"Drill as deep as possible and tap as shallow as possible," is a good rule to follow when tapping blind holes. Blind holes present the additional hazard of chips packing in the bottom of the hole, frequently resulting in tap breakage.

This condition can be alleviated by drilling the hole deeper than necessary for the required thread depth to provide additional room for chips.

Little Gain—Size of the hole drilled for the tap plays an important part in successful tapping. Most tapping and threading charts furnished by the manufacturers of taps and drills suggest the use of tap drills of sufficient diameter to provide a thread depth of about 75 per cent.

A full or 100-per-cent thread depth requires three times more power to tap than a 75-per-cent thread; the full thread is only 5 per cent stronger.

Varies—The 75-per-cent thread, standard for most purposes, is not satisfactory in all cases. Actually, thread depth may vary from 50 to 80 per cent, depending on requirements of the individual job.

The choice of a tap drill depends on three factors: The diameter and pitch of the thread, depth of the tapped hole and the nature of the material being tapped. Careful analysis of these factors usually will provide a satisfactory solution to the problem of choosing the proper tap drill size.

Ratio—The smaller the diameter of the thread, the greater the double thread depth in proportion to the basic major diameter. For example, the double thread depth of a ¼-in. x 28 thread is about 18 per cent of the basic major diameter. For a 1-in. x 14 thread, it is only 9 per cent.

This often results in excessive tap breakage because of the proportionately greater cutting load and relatively small cross section of the tap. This indicates that the tap drill should be proportionately larger to produce less than the usual 75-per-cent thread if easier

SUGGESTED SURFACE SPEEDS FOR THREADING

MATERIAL	SURFACE SPEED F.P.M. Threads Per Inch			
	3 to 7½	8 to 15	16 to 24	25 and up
Aluminum	50	100	150	200
Bakelite	50	100	150	200
Brass				
Bar Stock & Castings	50	100	150	200
Forgings	25	40	50	80
Stampings & Tubing	40	80	100	150
Bronze	40	80	100	150
Naval Bronze	25	40	50	80
Copper	40	80	100	150
Everdur	20	30	40	50
Fiber	50	100	150	200
Iron				
Cast	25	40	50	80
Malleable	20	30	40	50
Wrought	15	20	25	30
Magnesium	50	100	150	200
Monel Metal	8	10	15	20
Nickel	25	40	50	80
Rubber — Hard	50	100	150	200
Steel				
Carbon 1010-1035	30	30	40	50
Carbon 1040-1095	15	20	25	30
Chrome	8	10	15	20
Forging	8	10	15	20
Manganese	15	20	25	30
Molybdenum	8	10	15	20
Nickel	8	10	15	20
Stainless	8	10	15	20
Stamping	15	20	25	30
Tool	8	10	15	20
Tubing	15	20	25	30
Semi-Casting	25	40	50	80
Zinc Die Casting	50	100	150	200

NOTE: For all Taper Pipe Threads use 75% of speed given.

SUGGESTED LUBRICANTS FOR THREADING

MATERIAL	LUBRICANT
Allegheny Metal	Sulphur Base Oil
Aluminum	Kerosene and Lard Oil
Bakelite	Dry
Brass	Compound or Light Base Oil
Bronze-Manganese	Light Base Oil
Copper	Light Base Oil
Die Castings	
Aluminum	Kerosene and Lard Oil
Zinc	Compound
Duralumin	Compound or Kerosene and Lard Oil
Fiber	Dry
Iron	
Cast	Dry or Compound
Malleable	Compound or Sulphur Base Oil
Monel Metal	Sulphur Base or Kerosene and Lard Oil
Nickel Silver	Sulphur Base or Kerosene and Lard Oil
Rubber — Hard	Dry
Steel	
Cast	Sulphur Base Oil
Chromium	Sulphur Base Oil
Machinery	Compound or Sulphur Base Oil or Kerosene and Paraffin Oil
Manganese	Compound or Sulphur Base Oil or Kerosene and Paraffin Oil
Molybdenum	Sulphur Base Oil
Nickel	Sulphur Base Oil
1020 Screw Stock	Sulphur Base Oil
Stainless	Sulphur Base Oil
Tool	Sulphur Base or Kerosene and Lard Oil
Tungsten	Sulphur Base Oil
Vanadium	Sulphur Base Oil

tapping is desired on the smaller diameter threads.

A Way Out—The coarser the tap pitch, the greater the amount of material that must be removed. If a 75-per-cent thread depth presents tapping difficulties, reduce the thread depth gradually until good performance is obtained.

Any decrease in thread depth provides a proportionately greater reduction in metal removal due to the thread profile.

For this reason, a relatively small reduction in thread percentage will greatly facilitate tapping without any material sacrifice of thread strength.

Deep Holes—Depth of the tapped hole also has a bearing on tap drill selection. When tapping holes to a depth greater than 1½-times the diameter of the tap, difficulty is often encountered, owing to chip accumulation and inability to get sufficient coolant to cutting edges.

In these cases, use tap drills that provide less than a 75-per-cent thread. This is especially true for small diameter taps because of the limited chip clearance provided by their flutes.

Materials — Alloy steels and those which are tough or hard should be drilled with tap drills providing less than a 75-per-cent thread depth to promote easier tapping. Malleable metals which are soft and stringy should also be drilled for less than a 75-per-cent thread, owing to the tendency of these materials to flow toward the crest of the tap's minor diameter. This results in tap loading and a smaller diameter hole after tapping.

OD Threads—A properly turned diameter must be maintained prior to cutting external threads. Poor quality threads and chaser breakage will result from forcing the chasers to remove too much metal. Also, chasers must be kept sharp and should be ground in accordance with manufacturer's recommendations.

Two Keys—Proper surface speed is another important factor in successful threading. It is dependent not only on the material but also on the number of threads per inch.

Recommended cutting speeds are optimum starting points. Experimentation may be necessary to obtain best speed for a specific job.

Lubrication rates the same consideration as speeds. Use of the right lubricant for a specific material will result in a marked improvement in the threads, longer tap and chaser life, closer tolerances and less chip interference. A good volume of lubricant should be directed at the work so it reaches the point of cut with sufficient pressure to facilitate chip removal as well as to lubricate the cutting action.

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Proper alloy selection and good design mean . . .

Added Life for Brazing Fixtures

By CHARLES EMERY
Simonds Saw & Steel Co.
Fitchburg, Mass.

and

PAUL GOETCHEUS
Rolled Alloys Inc.
Detroit

DESIGNERS of furnace trays and fixtures often hold the key to low-cost brazing operations. Selection of the proper alloy is only part of the story. It's equally important to know what will happen to the assembly when it encounters job conditions.

By integrating design with the required properties of the alloy, the designer can increase the service life of fixtures and frequently reduce his materials costs. As more manufacturers turn to high-volume furnace brazing, the future of the process is tied more importantly to tray and fixture life and their replacement costs.

First Rule — There are many variations of trays or fixtures, but the designer should keep light weight, articulation and loose joints in mind. Heat resisting alloys expand and contract about 7/32-in. per ft through a cycle from room temperature to 2050° F, so adequate clearance must be provided in all directions.

One tight joint that will not allow for this movement can sufficiently overstress the involved member to cause immediate fracture or preliminary deformation leading to ultimate fracture.

Another Reason—The tray or fixture should be flexible and uniformly supported. If it is made rigid, it will be subjected to greater stresses than if articulated in some manner. These stresses could be caused by expansion and contraction of the alloy and the load carried by the fixture, or even from the weight of the fixture itself.

For example, a new fixture entering a new furnace might be uniformly supported by level rollers. But rolls seldom stay level, and a rigid tray is then subjected to severe bending moment as it rides over high spots in a warped roll.

Barn-Roof Design—A widely

Satisfactory structure of heat-resisting alloy is shown at left. Intergranular penetration of copper caused by spillage of braze metal (center) and heavy carbide precipitation (right) ultimately destroy fixture strength

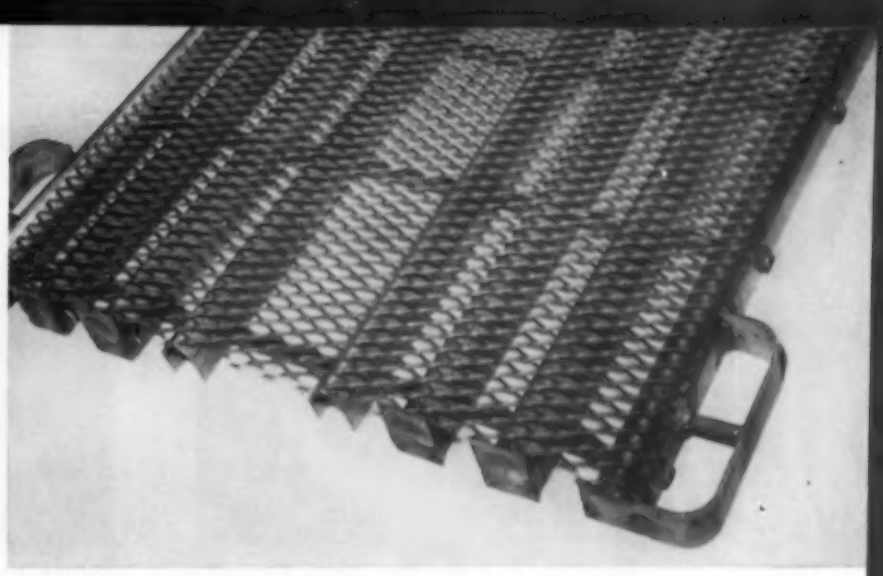
used tray is the barn-roof type, so called because supporting channels are rolled into this shape. Alloy sheet of 0.078 to 0.125 in. thickness is used. Lengths usually do not exceed 36 in. If trays are longer than 36 in., a joint to reduce bending should be provided.

These channels have holes punched about every 8 in. through which 5/16-in. round bars are loosely fitted. They are capped on each end by a welded-on washer. Spacers of pipe, welded or unwelded tubing are then strung on the bars to support the channel legs in the vertical plane.

Copper Problem—Molten copper braze metal has a tremendous affinity to wet over a large surface. When punching or shearing parts for the fixture, minute fractures in adjacent metal often result when tools have become dull. Copper seeps into the exposed metal, and a resultant copper-nickel alloy that is weak may be formed. This weakness can result in further fracture.

Since you can't always keep copper away from the fixture, it should be protected from the metal. One precaution, aside from using sharp tools, is to use rolled sections that have not been pickled. They will offer a protective oxide coating.

By the way, it's desirable to run new, empty trays through the furnace for an hour or so at 1950° F.



Typical base tray of "barn-roof" design shows articulated fabrication with tie rods and spacer tubing. This one was made of 330 alloy steel

Selecting the Alloy — Primary factors to consider, as in the selection of all high temperature alloys, are tensile strength, creep strength, corrosion resistance, thermal expansion, thermal and mechanical shock, stability and cost. The number of alloys acceptable for brazing applications is immediately limited to only a few (see table). They are the chrome-nickel types which are superior to the straight-chrome steels in load-carrying capacity.

Heat resistance of the alloys is derived from the formation of protective oxide coating which retards or prevents further attack on the underlying metal. Chromium is the principal alloying element that provides such protection, with nickel and silicon as supporting elements.

About Atmospheres — Operating continuously in a straight oxidizing atmosphere at 2000° F, the order of oxidation resistance of the three alloys would be 310, 309 and 330. Under protective atmosphere, however, all three resist scaling well.

In installations where control of atmosphere is difficult, sulphurous gases are sometimes present. In this case the higher chromium alloys outperform higher nickel alloys. Conversely, in slightly carburizing atmospheres higher nickel, such as in the 330, offers better resistance to carburization.

Choose the Right Alloy

Type	Evaluation
330 (35 Ni—15 Cr)	Excellent thermal shock resistance, such as encountered in oil quenching from temperatures above 1500° F, combined with greatest load-carrying strength. Possesses maximum resistance to absorption of carbon and nitrogen in working temperatures, and oxidation resistance up to 1950° F.
310 (25 Cr—20 Ni)	Stands up under moderate thermal shock and adequately resists corrosion from neutral or mildly carburizing atmospheres. In presence of sulphur, it is preferred over higher nickel alloys. Excellent characteristics and resistance to scaling up to 2000° F.
309 (25 Cr—12 Ni)	Excellent strength and oxidation resistance to 2000° F. Particularly suited for parts which operate at relatively constant temperature or receive moderate cyclic heating and cooling. Offers no resistance to carbon or nitrogen absorption.
430 (17 Cr)	Resists oxidation for intermittent use up to 1600° F. Should not be used continuously over 1450° F because of excessive scaling. Has lower coefficient of expansion than nickel-bearing types, work hardens less, and has tightly adhering scale when used in right temperature range.
446 (27 Cr)	One of the most oxidation-resistant alloys that can be produced. High-chrome content means less ductility and formability. Resists distortion from heating and cooling. Life of equipment operating in the intermediate temperature range can be increased by periodic annealing.

HERE'S HOW Hawkeye Steel Products spin draws parts for its livestock feeders and waterers. Metal used is Inland Steel Co.'s Ti-Co 20-gage galvanized sheet.

Fig. 1. Hydraulic fixture holds a 18 5/16-in. blank against the mandrel.

Fig. 2. Operation is about one-third complete. Roller, spinning freely, moves parallel to mandrel shape and rolls the metal over the mandrel. In this operation, roller is fed hydraulically about 0.040 in. per revolution of the mandrel at a pressure of 3500 psi. The blank and mandrel are turning at about 250 rpm. After loading, the entire operation is controlled automatically by hydraulics.

Fig. 3. Cycle has been completed.

Spin Drawing Rolls Away Costs

One machine can produce the same deep drawn parts that require a line of presses to make. Equipment investment is less, costly dies are eliminated

By WILLIAM E. DEAN
Associate Editor, Chicago

HAMSTRUNG by die costs in low production runs of circular and conical sheet metal parts?

Take a look at spin drawing. If it's adaptable to your work, it has these advantages over conventional processes:

1. Substantially lower die costs. 2. More uniform and deeper shapes. 3. Ability to hold close tolerances. 4. New flexibility in irregular contours and shapes. 5. Faster unit production. 6. Up to 60 per cent savings in production equipment investment.

Case in Point — Hawkeye Steel Products Inc., Waterloo, Iowa, saved about 40 per cent on labor and 25 per cent on material costs when it switched to spin drawing parts for its livestock feeders and waterers.

It formerly made them by blanking, forming and spot welding—operations which required considerable handling. Parts now are made in one operation (see photos) and no welding is necessary. Unlike conventional spinning, no craftsman is required to operate the machine.

G. A. Visser, of Swan Engineering & Machine Co., Bettendorf, Iowa, developed Hawkeye's machine. Spin drawing, he says, permits metal to flow to its inherent limit and avoids metallurgical disturbances and deviations common to conventional spinning and drawing.

How It Works—A punch or mandrel is made to the shape of the part. The metal to be formed is locked by hydraulic pressure to the nose of the mandrel. Both the mandrel and metal rotate. The spin drawing of the metal over the mandrel is done by one or more revolv-

Fig. 4. **Finished cone is punched, but no trimming is necessary. Dimensions: 18 5/16-in. at base, 11 in. high. Top of cone is 5½-in. in diameter. Thicknesses: 0.030 in. at base, 0.030 in. at center face of cone, 0.040 in. on top of cone.**

With a cast iron mandrel, a pitting condition on the nose section occurred after a few thousand pieces. Hawkeye officials discovered that by molding a tool plastic to a 3/16-in. undercut nose section, the problem was solved. The plastic nose also resulted in a better product appearance and drastic noise reduction. The slightly shaded area (top one-third of the cone) shows the portion of the mandrel nose which was plastic coated.

ing rollers which roll the metal over the mandrel in one continuous operation at a uniform pressure.

Key factors in spin drawing are hydraulic power and precision control of speed of the rotating mandrel and metal, pressure and feed of the roller against the metal.

Improvements Coming—Mr. Visser is developing an improved spin drawing machine which will use three rollers instead of one (as shown in the Hawkeye photos). Three or more rollers, he says, will permit better distribution of the metal, closer tolerances and faster production. Machines will be built for both vertical and horizontal operation, depending upon the size of the parts.

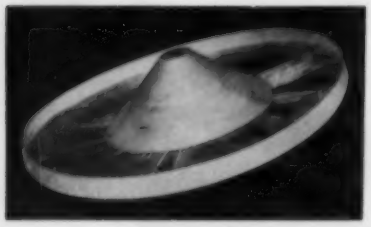
Close tolerances are held because there is no clearance between either the roller and the metal or the mandrel and the metal. Slight metal thinning (depending upon the metal used) may be experienced, but is compensated for in the roller tracer. Check Hawkeye's reduction experience using low carbon galvanized sheet in the spinning pictures.

Versatility in spin drawing is

Absence of metallurgical disturbances in spin drawing is demonstrated in the Rockwell hardness tests of the above galvanized sheet part. The range of 29.5 at the top to 33 in the middle and 31 at the bottom varies little more than readings on a flat sheet of metal.

This part—34 in. at the base and 15 in. high—was produced in one pass from a round blank. Swan Engineering officials estimate that if the part were produced by drawing, about $15,000 worth of dies and several draws would be required.

By comparison, spin drawing took about 40 seconds. Cost of the chuck was between $450 and $500. The part has a smooth surface free of wrinkles.



Metal flow in spin drawing not only occurs on the mandrel or punch but as far as 12 in. away from the point the roller attacks the metal.

The light streaks shown projecting away from the bottom of the cone are caused by the galvanizing of the steel and measure 12 in. in some places.

Metal used here is 18-gage galvanized sheet. Bottom of the part is 54 in. in diameter; cone in center is 25¼-in. at the base, 12 in. high and 5¼-in. across the top. The part was produced in one pass on a spin drawing machine at Swan Engineering.

gained by changing punches and tracers which the rollers follow. Experiments prove that metal can be spin drawn 90 degrees from the base—a tube form. The length-diameter ratio varies with the ductility of the metal. Comparative tests show that spin drawing permits greater lengths than conventional drawing or spinning.

Less Equipment—In addition to production time savings, Swan officials estimate up to 60 per cent savings in equipment investment. For example: In drawing a fairly deep shape, the economical operation will include as many presses (and dies) as there are draws. Spin drawing, however, takes only one machine and the part is produced in one pass. The machine will be relatively cheaper than the press needed for draws.

Production of conical shapes has not always been practical from a cost standpoint, Mr. Visser points out, and that's why such shapes haven't been used extensively in product design. With economical spin drawing of conical parts possible, he predicts, engineers will have new flexibility in product design.

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MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

THE HUGE Machine Tool Show is in the perspiration stage.

From now until opening day, builders will be planning and working to outdo their competitors at Chicago. In some cases they're doing it all with a cloistered secrecy that would raise the eyebrows of Washington's professional cloak and dagger men.

Silence — While many will exhibit machines announced before the show (a host of new models already are being sold), some builders answer any friendly question about show models with a curt "no comment." This even means that some salesmen don't know what their companies are showing.

On Guard — Take the case of Builder X (whose desire to remain anonymous is evidence of hushed plans). He will show some 20 machines. All are under wraps.

Ideally, he'd like to send the machines into the Chicago Amphitheatre one day before the show, set them up and have them running the next morning.

The rub is that roughly half of his machines already are in Chicago. An acute shortage of millwrights, electricians, etc., in the amphitheater means machines have to be there well in advance of the opening date.

Each builder has been assigned target dates, on which his machines are to come in.

Complicated — For Builder X, this complicates his job. Since the machines must be there weeks ahead of time, he has to keep them under tarpaulins or wrapped up to keep them out of sight. He has men from the home office on duty at the booth. They supervise the connecting of machines. At the same time, they are there to see that they stay under wraps.

To get into the amphitheater now, you have to be identified, checked, approved. An unauthorized person does not stand a chance of getting in to "shop" in advance.

Others—In addition to the problems of secrecy, Builder X has the usual and not-so-secret phases of organizing the show. His budget comes to about $200,000. That doesn't include any evaluation of the equipment. This must be well spent and accounted for.

Hotel rooms for all his personnel were reserved as long ago as April. The booth space was assigned last October, almost a full year before the show. Since that time, the builder has been designing and redesigning the booth. One interesting point: According to show rules, no backdrops can be higher than 5 feet. The show will take on the appearance of a huge machine shop.

The final thorn—the show opens the day after Labor Day. Any meetings of salesmen to plan strategy, any press conferences will have to be held on the holiday.

Visitors to the show will see the glamour. But plenty of builders will attest to the fact that before the glamour came sweat — and planning and secrets.

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JOB FACTS

- **Roughing and finishing operations performed on this SAE 120-121 Cast Iron Housing include multiple recessing shown in sketch. The three grooves were rough recessed in one station and finished recessed together with front and rear counterbore in another position.**
- **Three rough boring passes were finish-reamed with accelerated reaming attachment in one pass.**
- **Carbide tooling used throughout.**

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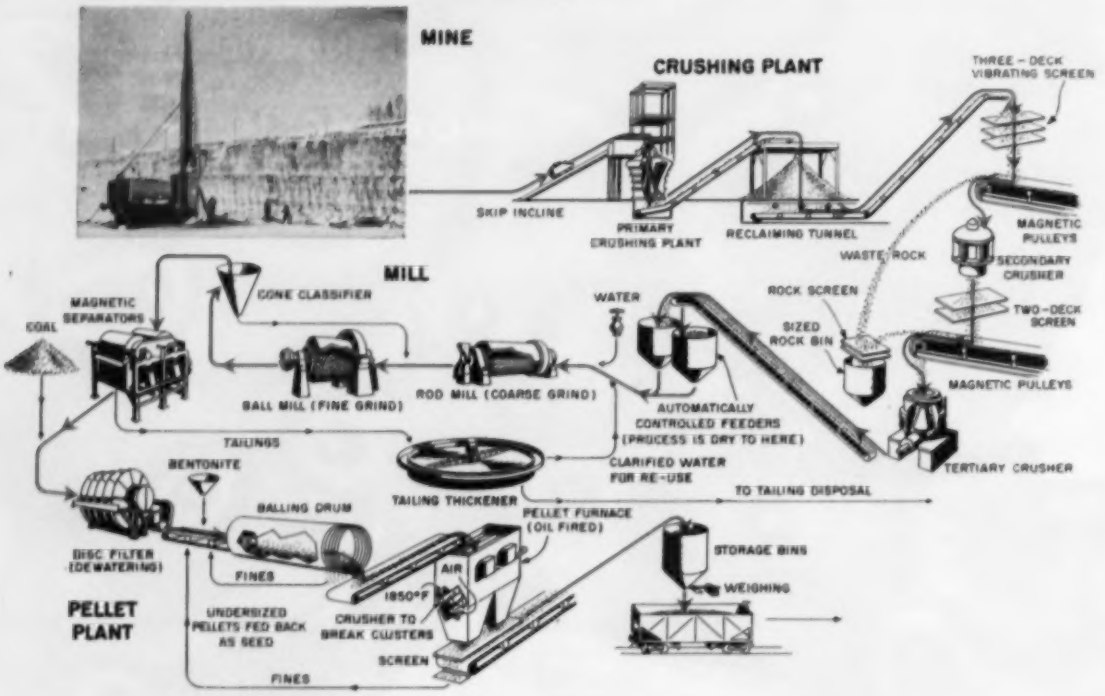

More Ore from Canada

Bethlehem gets half million tons of high grade concentrate from pit at Marmora, Ont. Low grade magnetite beneficiated by process like that used on Mesabi taconite

A BENEFICIATION process similar to those used for Mesabi taconite is enabling Bethlehem Steel to draw half a million tons of high grade iron ore concentrate annually from its new mine at Marmora, Ont.

The ore deposit, 130 miles northeast of Toronto, is a low grade magnetite, averaging 37 per cent iron. It is beneficiated by magnetic concentration and shipped 275 miles by rail and water to Bethlehem's Lackawanna, N. Y., stacks as pellets containing 65 to 67 per cent iron.

Found from Air—The ore body was discovered in an aeromagnetic survey by the Canadian government in 1949. Bethlehem followed with diamond drilling exploration and found the deposit was worthy of development. Before ore mining could start it was necessary to strip a cap of 20 million tons of limestone.

After five years of exploration, construction and stripping, shipments of the finished product started in May.

Mining—The pit is roughly ½ mile long, ¼ mile wide and 130 ft deep. Ultimately, it will go down to about 500 ft. Percussion drills with 6-in. tungsten carbide bits drill the ore on 45-ft benches. After blasting, the crude ore is loaded on 22-ton diesel trucks with 4½-yd shovels and hauled to the crushing plant at the edge of the pit.

A counterbalanced skip hoist delivers the ore to a 48-in. gyratory primary crusher which reduces the ore to minus 5-in. lumps. The product of the primary crusher goes to a surge pile to be drawn off as required.

From the surge pile, the ore is delivered to a secondary crusher which takes it down to minus 2

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in. and then to a tertiary cone-type crusher which reduces it to minus ½-in.

Grinding — Because iron-bearing mineral is present in extremely fine particles, it is necessary to reduce the crushed ore to talcum powder fineness, or minus - 100 mesh, before it can be concentrated. That is done by wet grinding in two 8 x 12 ft rod mills and two 10 x 10½-ft ball mills.

A cone-type classifier removes oversize particles from the discharge of the ball mill and sends them back for regrinding.

Separating — The finely ground ore, mixed with water, passes through magnetic separators. The separators consist of a cylindrical drum revolving around a fixed magnet and are suspended in a box through which the ore slurry is passed. The fine particles of magnetic ore are picked up by the revolving drum and carried over a bridge out of the magnetic field. Here they drop off the drum and are collected and pumped to dewatering filters or to storage pits in the pelletizing plant.

Nonmagnetic waste material, or tailings, is thickened and pumped 2000 ft for disposal.

Pelletizing—The magnetic iron concentrate is fed into a revolving ball drum where it is rolled into pellets with a maximum diameter of ¾-in. For a binder, a small quantity of bentonite is mixed with concentrate before balling.

The damp pellets are fed into an oil-fired vertical shaft-type furnace by an oscillating belt conveyor. Passing slowly through the furnace, they are first dried and preheated and then baked at 2200 to 2300° F to make them hard enough to withstand breakage in transit and the crushing pressure in the blast furnace.

Shipping — After cooling and screening to remove undersize material, pellets are conveyed to a bin for loading into bottom dump cars for rail shipment to Picton, Ont., 64 miles away. Here they are stored to await shipment by water to Lackawanna.

The mining, crushing and pelletizing operations will be on a year-round operation at Marmora. During winter months, pellets will be accumulated at Picton until the spring navigation season opens.

Ceramic Process: Boon to Cermets

A RAPID, economical process for putting a common cermet coating on a metal base may enhance the future of the hard, high-temperature coatings.

Developed by the National Bureau of Standards, the method uses a mixture of chromium-boron-nickel cermet powder and ceramic frit. It employs ordinary ceramic coating procedures to replace the flame-spraying technique.

Here's How—A slip is prepared from a cermet powder and ceramic frit. The slip is put on the metal part at room temperature, either by dipping or spraying.

The part is fired at a temperature above the melting point of both the cermet and the frit. During firing, the ceramic serves as a flux to permit welding of the cermet particles without the necessity of a purified, oxygen-free atmosphere.

Depending on the firing temperature, the ceramic either sweats out to the surface or remains as occlusions in the cermet network.

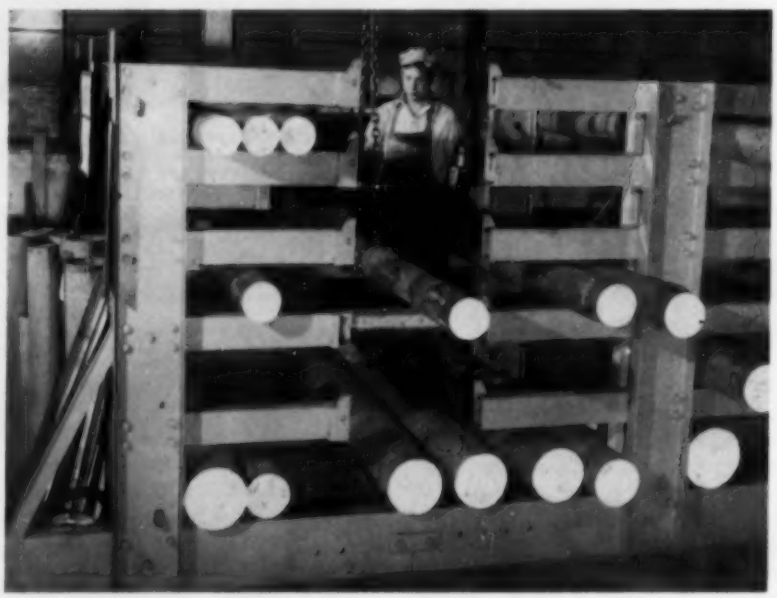
Firing time seems to have little effect on the appearance of the coatings; a coating appears the same after 16 minutes of firing as it does after 2 minutes.

Proportions—The coating that gave NBS the best continuity of the Cr-B-Ni layer was obtained from a mixture of 10 parts frit, 90 parts cermet and 5 parts of clay by weight. Thickness in the range of 0.004 to 0.008 in. can be achieved in a single coating.

For greater thicknesses, multiple coatings are recommended. For thinner coatings, finer grinding of the slip is required.

Results—The NBS coatings are said to have excellent thermal shock resistance and are reasonably ductile. The ceramic-style process may have it over flame-spraying in three areas.

First, it probably is better suited economically to high-production schedules. Second, it can be used easily to coat small inside diameters of cylindrical parts. Third, while flame spraying is not feasible where thin layers (about 0.002 in.) are required, the NBS process handles them with ease.



Easy Come, Easy Go

These racks at Landis Machine Co., Waynesboro, Pa., make it easy to store heavy bars—there's no fumbling in a pile of other heavies to get the right bar in or out. Movable bridges, put between the racks, let the bars roll across the aisles. The specified bar can be brought onto the bridge and hoisted out. It's the only bar that's lifted

CHECK THE ADVANTAGES OF STAINLESS STEEL FASTENERS

✓ for boosting product quality!

Where appearance and performance call for quality parts, don't overlook the advantages of stainless steel fasteners. Take the illustrated E. W. Ferry fasteners, for example. They're priced right in line with quality fasteners of other materials. Yet they offer all the extra qualities stainless steel brings to any part — high tensile strength . . . attractive, rust-resisting finish . . . and remarkable resistance to heat and corrosion. In almost any application they outlast, many times over, fasteners of nonresistant or plated metal. They cut maintenance costs, too. For even after years of service, disassembling rust-free stainless fasteners is always a fast, easy operation.

✓ for reducing production costs!

The hardness of stainless steel fasteners results in substantial savings on the assembly line. Work is faster, results are better — simply because stainless screw-heads are less apt to burr and nick. This means major savings, for even a slipping screwdriver can seriously damage both the screw and the parts being assembled. Stainless steel fasteners cut tooling costs, too. For they are now available in practically every size and description.

Crucible now offers stainless fastener wire in all diameters . . . in suitable tempers . . . in a variety of finishes, including bright and several metallic and nonmetallic coatings . . . in all standard grades. For prompt delivery of the stainless steel wire you need — or for your free copy of Crucible's new, 32-page catalog "Rezistal Stainless Steel Wire" — call or write to *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

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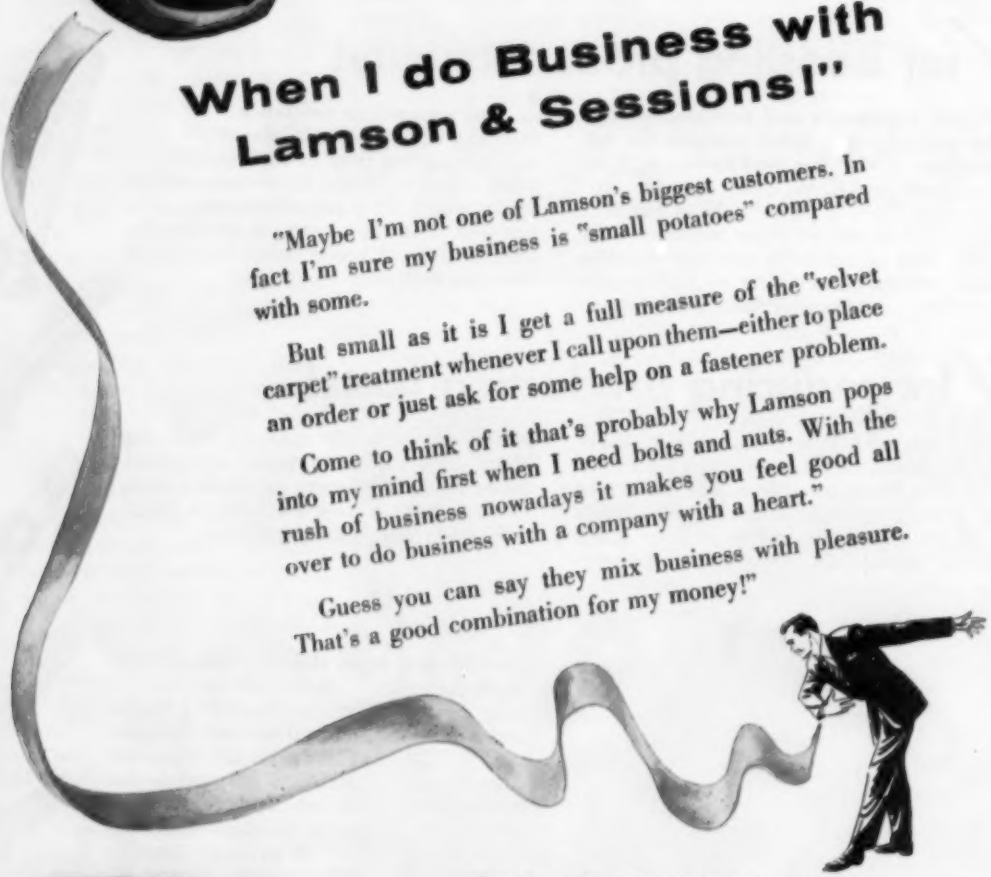
When I do Business with Lamson & Sessions!"

"Maybe I'm not one of Lamson's biggest customers. In fact I'm sure my business is "small potatoes" compared with some.

But small as it is I get a full measure of the "velvet carpet" treatment whenever I call upon them—either to place an order or just ask for some help on a fastener problem.

Come to think of it that's probably why Lamson pops into my mind first when I need bolts and nuts. With the rush of business nowadays it makes you feel good all over to do business with a company with a heart."

Guess you can say they mix business with pleasure. That's a good combination for my money!"



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Piercing machine discharges rough heads into skid hopper, ready for delivery to next operation

Work in process is tiered in temporary storage up to four units high by high-lift platform truck

AXMAKING:

Skid Bins Chop Handling Time

A SKID—LIFT-TRUCK system is the key to materials handling efficiency at the Kelly Works of True Temper Corp., Charleston, W. Va.

Its major product is axes, produced at the rate of 5000 per 8-hour shift. Seven electric platform-lift trucks of 4000 and 6000-lb capacity and about 1000 steel skid bins carry the axes through production.

How It Goes—Axes are forged from steel billets. After shearing, billets fall into waiting skid bins. Trucks pick up the loaded bins and carry them to a battery of machines where billets are: 1. Heated to forging temperature. 2. Forged into ax heads. 3. Trimmed. 4. Pierced for handles.

Following piercing, still-hot heads drop into waiting skid containers ready to be trucked to a scale for weight counting. Scrap from the trimming operation accumulates in drop-bottom skid bins, which are carried to the scrap pile and dumped by platform trucks.

Normalizing—Counted parts are delivered to a conveyorized furnace for normalizing, or are tiered in interim storage. High-lift trucks tier skid-bin loads up to four units high.

After normalizing, work again is accumulated in skid bins ready for delivery to the finishing department. Some items, such as sledge-hammer heads, are further processed by tumbling—an operation also serviced by the skid — lift-truck system.

Storage — The system permits high utilization of space for temporary storage of work loads. The largest interim storage area is devoted to production which has been completed in the forge shop and is awaiting finishing, inspection and packaging.

During a year, the Kelly Works converts about 6000 tons of high-grade carbon steel to finished products. To keep this volume of material flowing through the forge shop without interruption keeps the industrial trucks in nearly continuous service. Trucks are powered by Edison storage batteries, which are serviced and charged at the end of each shift.

Older employees of the Kelly Works recall when material was moved in wheelbarrows. Nearly as many employees were assigned to materials handling as were required for production. Currently, the plant employs about 600 people. Only six of them are directly engaged in the handling of materials.

Pure aluminum oxide, applied by flame spraying, makes a rock-hard surface that can take jet heat. Rockets saw it first, but look for other uses

Coating for the Hot Spots

FOR YEARS refractory coatings for metals had melting points lower than the base material. New ones developed by the Norton Co., Worcester, Mass., reverse this picture.

Called Rokide, the name should stand a good chance of becoming as generic as frigidaire or ping-pong. The coatings form a rock-hard hide. Their first use was in rocket engines.

The List — There are four of them now, with more to come: Rokide A—aluminum oxide; Rokide ZS—zirconium silicate; Rokide Z—stabilized zirconia; and Rokide C — silicon-carbide-coated graphite. Z is still experimental, but the others already are making their way in jet engines, guided missiles and atomic energy.

Rokide C is the oldest. It is prepared by exposing a graphite surface to the vapors from boiling silica sand to form silicon carbide. Graphite combustion tubes in Nike rockets are coated in this way to increase their wear and oxidation resistance.

Debut — The wraps have just come off Rokide A. An adherent, white, grainy coating, it is harder than the hardest steels, with excellent resistance to heat shock and a melting point close to 3600° F. Its thermal conductivity is so low that an 0.025 in. coating has been melted in an oxyacetylene flame without harming the backing metal. It can be bent 90 degrees without chipping.

Getting the coating on the backing turns out to be fairly simple. An aluminum oxide rod is fed through a gun much like a metallizing gun, where it melts in an oxyacetylene flame. An air jet blows plastic droplets of alumina from the gun. If the surface to be coated is first roughened, the impinging droplets adhere tightly.

How Thick?—By this means it is possible to build up a coating from 0.005 to 0.10 in. thick. Though appearing dense, it is porous. Norton engineers expect to increase its density, which will add corrosion prevention to its already impressive list of properties.

One property with special meaning to reaction engine designers is the low emissivity coefficient of 0.3 to 0.4 (emissivity is the ratio of heat radiated compared with the radiation of a theoretical black body at the same temperature having a emissivity factor of 1). In a ram jet combustion chamber it's important to have low emissivity to reflect most of the heat.

Base—The range of materials that can be coated with Rokide A is wide: Iron, steel, nickel alloys, copper, aluminum, brass, molybdenum, graphite, ceramics, glass, zinc, magnesium, plastics, lead, solder, fiber glass, asbestos, titanium. Size also is no limitation, except that long tubes or holes less than 2 in. in diameter present a problem for the spray gun to reach. Tubes as large as 30 in. in diameter and 6 ft long have been coated.

Coating speed varies, of course, with depth of coating and configuration of the part, but using a $\frac{1}{8}$ x 28 in. Al_2O_3 rod, a 3 x 5 in. panel can be coated in 6 minutes to a depth of 0.01 in.

Ready—Coming down out of the clouds, there are a lot of potential uses for this sort of coating in furnaces and electrical equipment that are itching for exploration. For anyone wanting to give it a try, Norton has a nonexclusive license and royalty arrangement.

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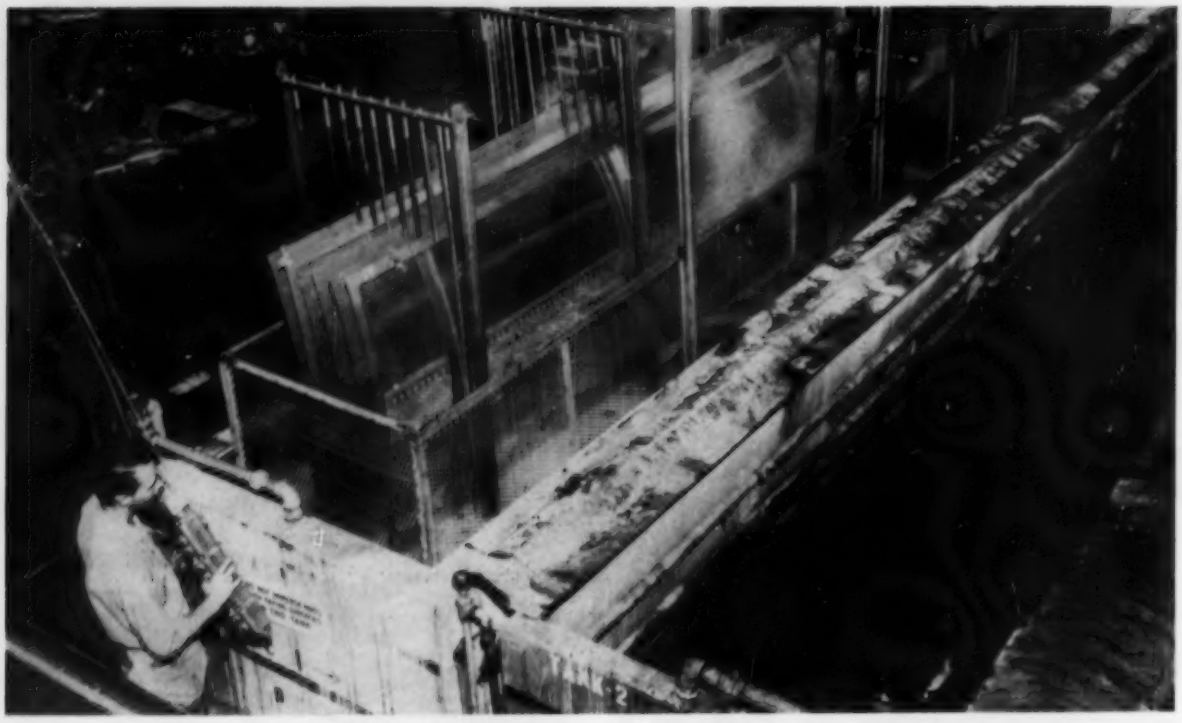

In a battery of 50-ft tanks at Lockheed Aircraft Corp. . . .

Chemical Coating Gains Another Convert

By W. CASTELL
Lockheed Aircraft Corp.

ANOTHER AIRCRAFT company has gone over to chemical conversion coating for aluminum. The big coating line at Lockheed Aircraft Corp., Burbank, Calif., is bringing savings in time, money and effort beyond anything imagined when it was put in.

Some of the savings: No anodizing racks to replace (they used to cost $15,000 a year). Negligible upkeep on the stainless steel handling equipment (it isn't attacked by the processing solutions). No rectifiers to maintain. No fancy exhaust system. No worries about electrical shock.

During the first nine months of operation, savings on materials and labor amounted to $40,000.

How Come? — Modern aircraft design constantly makes heavier demands on aluminum and its protection against corrosion. Integrally stiffened skins in the wings of Lockheed's Model 1049 Constellation called for stronger aluminum. Aluminum alloy 75-ST was chosen.

Thus began a chain reaction—the stronger the alloy, the greater the chances of corrosion and the more stringent the protection requirements. Lockheed's processing tanks for chromic acid anodizing were not adequate to handle efficiently these large machined skins. Expanded up-to-date facilities were required.

Try Chemicals—Tanks 50 ft long, 12 ft deep and 4 ft wide were decided on. While facilities were in the design stage, it was suggested that anodizing could be replaced by a chemical film process (government specification MIL-C-5541). Initial evaluation pointed to reduced installation costs and manpower savings. Laboratory tests with chemical film processes disclosed corrosion protection equal to or better than anodizing.

The process which produced the best results was thoroughly tested for service life by processing samples through a 1-gallon solution. Stability and economical upkeep of solution promised savings. Small chemical additions kept it operative through several weeks. Maintenance of concentration and pH presented no difficulty.

Iridite—On the strength of this investigation, it was decided to use Iridite No. 14 in the large processing tank. Chromodizing facilities were included to process exterior skins of clad aluminum requiring a bright finish.

The Iridite process (Allied Research Products Inc., Baltimore) produces a complex chromium-chromate film rather than an oxide or phosphate. It is generated by a reaction occurring when the aluminum part is immersed in the solution; the film becomes an integral part of the metal. However, the amount of aluminum entering into the reaction is so slight (film thickness is about 0.00001 in.) that dimensions of closely ma-

chined surfaces are maintained.

Features—Treatment does not produce embrittlement, and the film is abrasion resistant, adaptable to cold forming and may be dyed for identification. It provides corrosion resistance superior to anodic films on some alloys and gives lasting paint adhesion.

Total production finishing of all aluminum alloy parts was changed to the new tanks in one day. Within 48 hours the old equipment was dismantled and production has been running without interruption since. The process has proved so much faster than anodizing that manpower reductions were made right from the start.

Racks—Proper racking of parts was found to be of utmost importance in obtaining a satisfactory finish. To handle the great variety of parts, from 50-ft spars to little clips and washers, stainless steel baskets 25 ft long were designed.

Small parts are placed in trays or small baskets within the large baskets. Only large machined skins 30 to 50 ft long require special racks. Parts are simply laid in baskets with proper supports, as compared with individual part racking requiring use of torque wrenches to assure good electrical contact in the anodizing tank.

In any given time, about three times as many parts can be processed as in an anodizing tank of equal size, and the chemical method requires less than one-tenth the processing time—only 4 minutes.

In Favor—Simplicity of the process means more efficient scheduling, elimination of complicated racking and virtually no complete reworking of parts. Tank loading is determined by number of baskets rather than by shape of parts and methods of racking. Scratched or damaged parts can be repaired by applying the solution locally by brush without interrupting production flow.

Aluminum tubing can be coated after bending and flaring, developing a uniform film on inside and outside surfaces. (On anodized tubing, the flared end and inside surface had to be left unprotected.) Dissimilar-metal parts such as steel inserts, fasteners and clips can be processed along with aluminum without sustaining damage.

Lockheed's Conversion Coating Line

PROCESS STEPS	TANK CONSTRUCTION
1. Alkaline Cleaner Tank 8 oz per gal Altrex aluminum cleaner. Operating temperature: 190° F. Immersion time: 10 minutes minimum.	Plain steel tank; steel pipes for 100 psi steam pressure. Circulating pump and overflow dam.
2. Cold Water Rinse Tank	Plain steel tank. Spray nozzles and overflow dam.
3. Chromodizing Tank	Plain steel tank with steel steam coils. Ventilated.
4. Cold Water Spray Rinse Tank	Thin gage steel tank with concrete bottom.
5. De-oxidizer Tank 8 oz per gal Oakite No. 34 solution with addition of 1 per cent of sulphuric acid. Immersion time: 3 minutes maximum.	Koroseal-lined steel tank.
6. Iridite No. 14 Tank 3 oz per gal Iridite No. 14 compound. Operating temperature: 85° F. Immersion time: 3 to 4 minutes.	Koroseal-lined steel tank with stainless steel heating coil.

A daily check of pH proves advantageous in maintaining the solution within the range, pH 1.5 to 1.7, by frequent small additions of nitric acid.

7. Cold Water Spray Rinse Tank	Thin gage steel tank with concrete bottom.
8. Hot Water Rinse Tank Operating temperature: 140 to 160° F. Immersion time: 1 minute maximum.	Vinyl-lined steel tank with vinyl coated steel steam pipes.
9. Hot Air Dryer Operating temperature: 200° F maximum.	Steel tank with air-operated sliding lid made of steel frame and plywood. Steam heated with four Airfin heaters and blowers.

All tanks: 4 ft wide x 12 ft deep x 50 ft long

ADDITIONAL EQUIPMENT

Water Demineralizer connected to hot water rinse tank to eliminate streaking or spotting of chromodized exterior skins from hard water deposits and to control pH below 6.8.

Recording Temperature Controllers for chromodizing and Iridite solutions, and for the hot air dryer.

Temperature Indicators and Self-Actuating Temperature Controllers for alkaline solution and hot water rinse tanks.

Exhaust Ducts and Fan for chromodizing tank.

Slurry Tank to facilitate chemical additions to the alkaline cleaner.

Portable Stainless Steel Tank and Pump to make additions to chromodizing, de-oxidizer and Iridite tanks.

Stainless Steel Baskets and Trays to transport parts through solutions.

Stainless Steel Racks to handle large machined parts.

Crane Hoist capacity of 8000 lb.

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More finished stampings per shift at lower cost is the final test of a new press line . . . to meet this test, production men concentrate on fast, *uninterrupted* production from one end of the line to the other. Every press is a vital station, every operation is critical in keeping the line running as a mass production unit.

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There's a great deal more to the Danly Press story, too — design and construction features that will make Danly Presses a must on your new line. Call a Danly engineer for a detailed discussion now.

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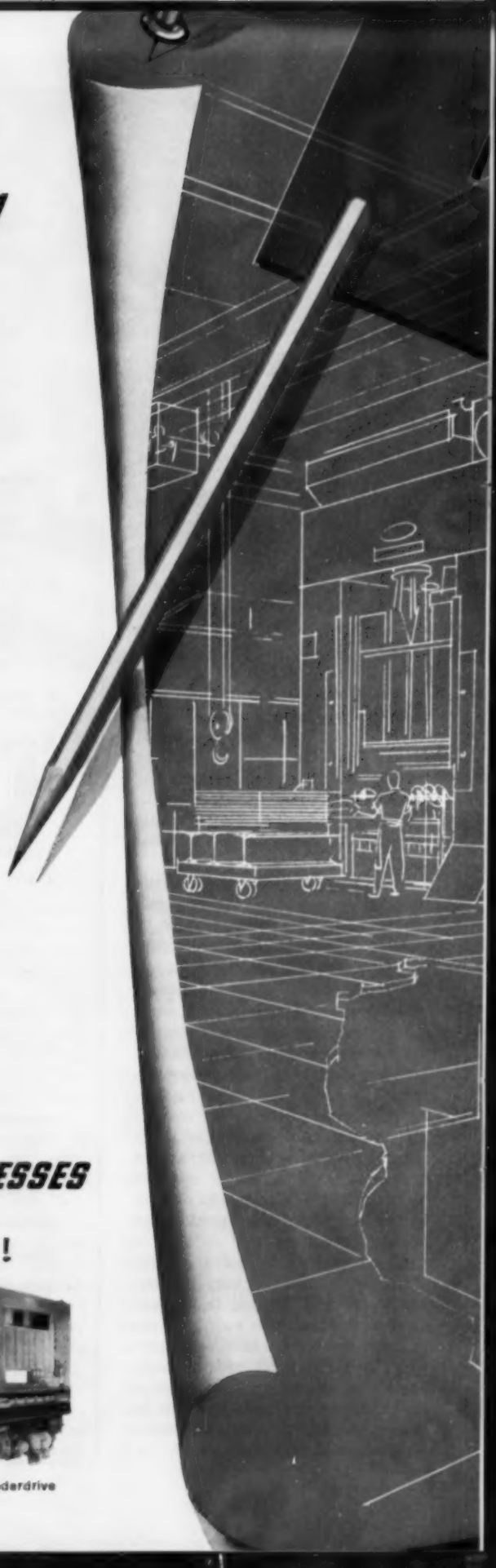

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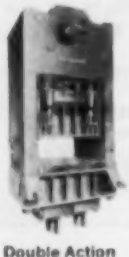
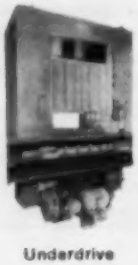
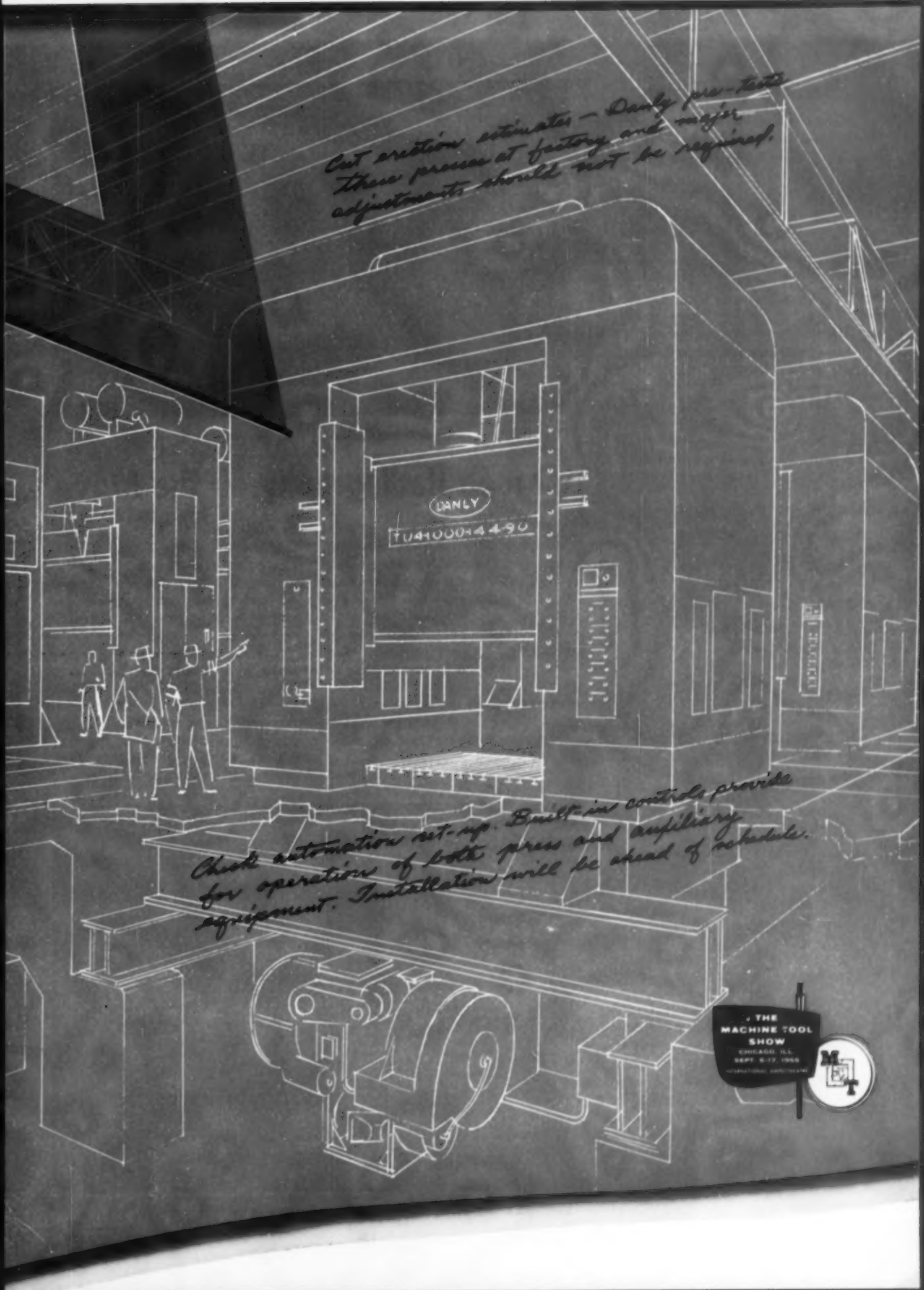


Double Action Straight Side



Underdrive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CHICAGO, ILL.
SEPT. 6-17, 1965

Plastic-Coated Sheets

They combine the strength of metal with the bright colors and toughness of vinyl

LARGE SHEETS of steel and aluminum with a colorful skin of abrasion-resistant, rustproof vinyl plastic come off the production line at Clad-Rex Steel Co., Denver, at a rate of 4000 sq ft an hour.

The vinyl-clad sheets, measuring 4 x 8 ft, are used for wainscoting in hospitals, schools, hotels, office buildings, bathrooms and kitchens. Other applications in the offing: Counter topping, kitchen cabinets, truck and trailer body panels, office furniture, radio and TV cabinets and other appliances.

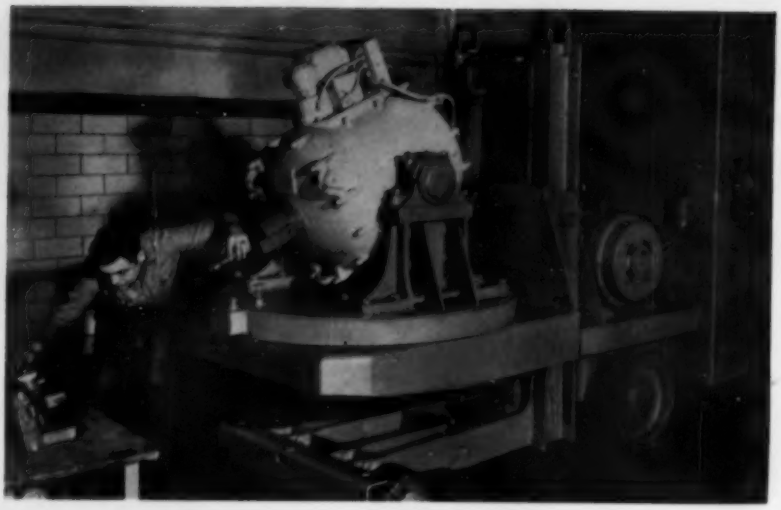
The Process—Vinyl is bonded to the metal by the Marvibond process developed by Naugatuck Chemical Division, United States Rubber Co. The sheet metal first passes through a long metal treating machine in which the sheets are chemically cleaned and etched. Then, they move along power rollers to the first adhesive-applying machine.

LAMINATED SHEET

. . . is trimmed in shearing machine

A thin film of adhesive is put on and dried with infrared lamps. The sheets move along another set of rollers to a second coating machine. More adhesive is applied, and it again is set with heat lamps.

Vinyl Applied—Immediately after the second coat, the vinyl film is applied to the metal. The plastic is put on with a roller, using moderate pressure. Individual sheets are finally trimmed in a shearing machine.



Operator aims cobalt-60 instrument at test specimen

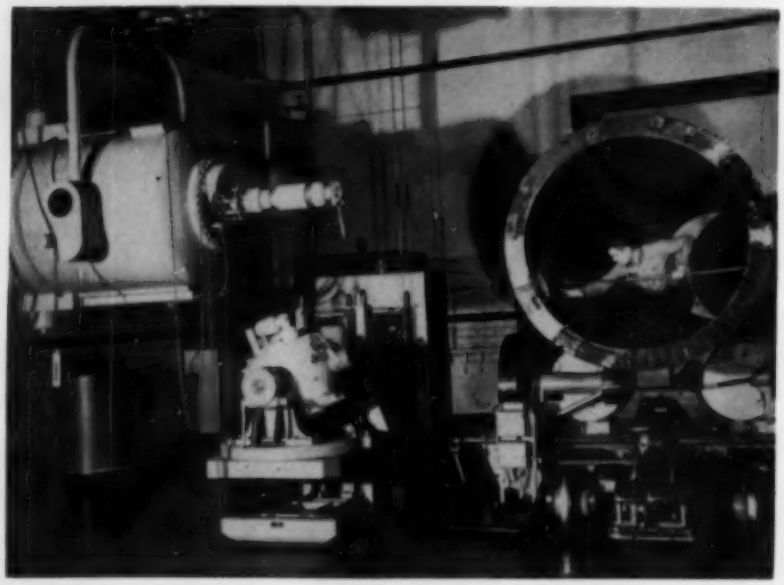
Isotope Radiography on the Move

A NEW inspection tool uses radioactive cobalt-60 to "see through" steel 7 in. thick. Named the Isoscope, the instrument requires only one-third the exposure time of a 1-million-volt x-ray unit.

The charge — 1008 curies of cobalt-60—consists of small discs stacked atop one another like coins in a coin changer. Radiation is taken from the top of the stack, so that the size of the focal spot compares favorably to existing high-voltage x-ray equipment.

Handling Ease—Mounted on a modified electric platform truck, the instrument can be raised 8 ft, rotated vertically 210 degrees; horizontally, 360 degrees. A lead cab on the back of the truck provides protection for the operator and contains the controls.

The Isoscope was developed by Babcock & Wilcox Co., Barberton, O. Company officials point out that this tool will enable small foundries and plants to invest in high-energy radiographic equipment where the cost of high-voltage equipment may be prohibitive.



Radiographing pressure vessel walls. Two-million-volt x-ray is at left

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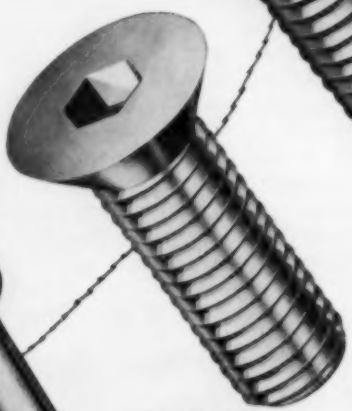
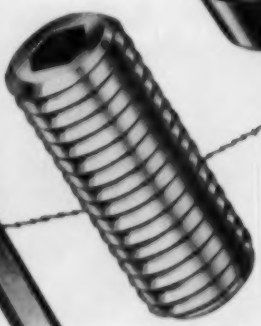
SIZE-MARKED SOCKET HEAD CAP SCREWS

BUTTON HEAD SOCKET CAP SCREWS



FLAT HEAD SOCKET CAP SCREWS

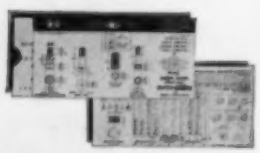
SHOULDER SCREWS



GROUND THREAD SOCKET SET SCREWS

ENGINEERED HEX KEYS

PIPE PLUGS



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make planned assembly savings pay off

Flying Press Has Greater Speed, Productivity

Coils of steel are fed intermittently through conventional stamping and shallow draw presses by a press feeder mechanism. The coil is stopped for each strike of the die. Speeds seldom top 150 strokes a minute.

With the new flying press, the necessity for starting and stopping the feed of the coiled steel is eliminated; material moves through the machine at a continuous speed. The upper and lower dies move forward to synchronize with the speed of the strip during stamping. This increases the number of parts that can be made each minute and gives greater accuracy to the length fed into the press. Production speed is 600 to 900 strokes a minute.

Maintenance and downtime are less with the new unit. The new press has neither clutch nor brake. It has no flywheel; it stores its energy in the motion of the dies and die holders.

In the new machine, the velocity of the completed part becomes greater and is ejected from the press with greater ease as the production speed increases.

The flying press is a package unit. All controls are mounted on a stainless steel panel on one side of the machine. It will be built in 60, 100, 150 and 200-ton sizes, with strip capacity of 3 to 72 in. widths. A 60-ton, hand-built prototype is shown. *Write:* Wean Equipment Corp., 22800 Lakeland, Cleveland, O. *Phone:* Redwood 1-7000

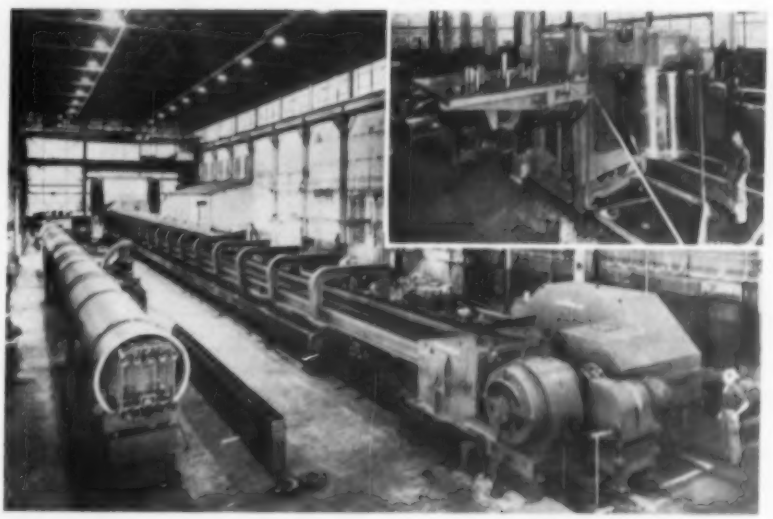
Long Drawbench Teamed with Inverted Bull Blocks

Combine this dual-chain drawbench with inverted bull blocks and you can produce continuous 1-in. OD tubing more than 800 ft long. Smaller diameter tubing can be drawn proportionately longer.

Tubing can be drawn to 200 ft on the drawbench. Five tubes are worked simultaneously. They are loaded into the top of the rotary cylinder; the cylinder is rotated 180 degrees; and tubes are ready to draw. A high-speed roll instead of a pusher feeds tubes onto the mandrel. An Air Flex Clutch is used for a smooth hook-on at the start of the draw.

The inverted bull blocks (see inset photo) have a capacity of 10,000-lb pull from 150 to 500 fpm, tapering to 3300 lb at 2000 fpm. Speed selection is by rheostat.

Automatic discharging of the tube onto a belt conveyor speeds the return of the drum coil to the starting position. Blocks have a 60-in. diameter and 52-in. working face. *Write:* Aetna-Standard Engineering Corp., Pittsburgh, Pa. *Phone:* Grant 1-6920



NEW PRODUCTS and equipment

Power Sweeper

This new unit has no dust bag to empty. Fine dust is deposited into the main hopper automatically. Automotive-type steering gives greater maneuverability and the smoothed-out, streamlined effect enables the sweeper to work closer

to walls and equipment without bumping or snagging.

Sweeping paths range from 36 to 68 in. Maximum sweeping coverage is over 100,000 sq ft an hour. *Write*: Wayne Mfg. Co., Pomona, Calif. *Phone*: Raymond 3-6321

Single Mast Lift Truck

The Hyster Monomast gives the operator an unobstructed view of the forks and load. This means faster maneuverability, faster approach, more accurate load placing and safer load handling.

The tubular design of the truck makes it stronger than comparable models. Torsional rigidity in the mast has been increased 80 per cent. Mast deflection is reduced 50 per cent over conventional upright or mast assemblies. *Write*: Hyster Co., 2902 N. E. Clackamas, Portland 8, Oreg. *Phone*: Tuxedo 5011

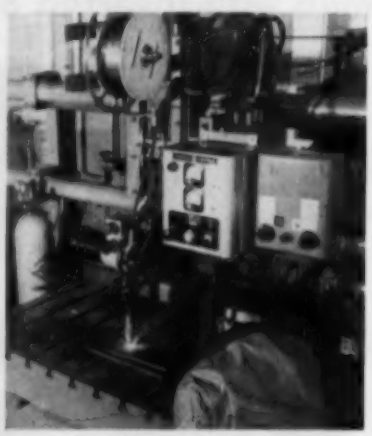
Preload Indicator

The PLI washer consists of two concentric steel rings, one fitting freely inside the other. It takes a predetermined load to compress the higher inner ring to the height of the outer ring.

Sandwiched between two high-strength washers under the head of a bolt or under a nut, the device provides an accurate, fool-proof means for tightening bolts to predetermined preloads as high as 80 per cent of bolt yield strength. The technique is accurate to plus or minus 10 per cent of preload. *Write*: Standard Pressed Steel Co., Jenkintown, Pa.

Automatic Welder Uses Carbon Dioxide Shield

Here is consumable-electrode welding equipment especially adapted for use with low-cost carbon dioxide shielding gas. The wire electrode is fed to the arc and no flux is used.



The visible arc feature will allow substantial savings through the use of more simple fixtures and up to 50 per cent faster operation on certain applications through reduction of setup time.

Heart of the new equipment is the self-regulating Fillerarc generator. It has a rising volt-ampere characteristic matching the rising volt-ampere characteristic of the arc with the gas. The rate at which the electrode burns off always matches wire-feed speed, and the arc remains constant.

Equipment includes wire-feeder, torch, control panel, reel mount and motor-generator unit. It employs high wire speeds (up to 1000 ipm) and short arc lengths to produce a penetrating arc with a minimum of spatter.

Other features include all-position operation; a compact, combined operator station-control panel with two pushbuttons that control operation; adaptability to light or heavy-gage materials; easy tack welding; and a crater-filling circuit which is available to taper wire speeds at the end of the weld. *Write*: Welding Dept., General Electric Co., York, Pa. *Phone*: 82-138

Air Flatness Gage

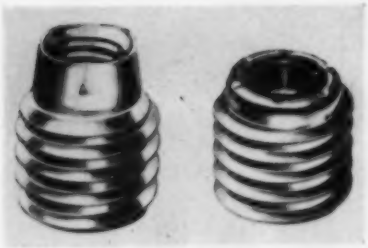
A rapid and accurate method of checking surface flatness is provided by the Model A-582 B4. It consists of a Dimensionair air gage with probe and a black granite surface plate.

The plate has a guaranteed accuracy of 0.000050-in. for any 2 x 2-ft area. Dials are graduated in increments of 0.000050 and 0.000020-in. *Write*: Federal Products Corp., 1144 Eddy St., Providence, R. I. *Phone*: Stuart 1-9300

Self-Locking Bushing

The ESNA type 2424 is designed for relatively soft castings, forgings and extrusions. It provides a self-locking blind fastening which adds to the strength and prevents wear of tapped holes in machined parts.

The bushing is available with



a nylon locking collar for temperatures to 250° F and with a metal locking device for temperatures between 250 and 550° F. Internal thread sizes are 10-32, ¼-28, 5/16-24 and ⅜-24. *Write*: Elastic Stop Nut Corp. of America, Union, N. J. *Phone*: Murdock 6-6000

Platen Grinder

The Curtis 91 uses a serrated contact belt and contact roll for grinding and polishing flat and radius surfaces. Coated abrasive belt life is increased substantially.

The grinder is equipped with three station tables, one on each side and one on the end of the unit. They are adjustable for angle grinding. *Write*: Curtis Machine Corp., Jamestown, N. Y.

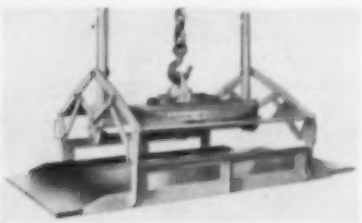
Die-Handling Trucks

These units are designed to handle dies and templates into and out of metalworking presses and storage areas. They are equipped with flip-over-type die-handling pins that permit pushing the die off the platform with the face of the pin block.

Die handlers are available as part of the Transtacker line of equipment, in capacities of 3, 4 and 6000 lb, with standard mast heights of 68 and 83 in. *Write*: Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill. *Phone*: Radcliff 3-7000

Motorized Sheet Lifter

The arms move in and out in a straight line rather than in an arc. Because they remain vertical at all times, there is no need for manual adjustment when changing from one size sheet to another. All operations are controlled by the craneman.



End grabs for wide or long sheets can be added. A motorized rotating mechanism can be incorporated with the lifter, permitting it to be turned horizontally in any direction. *Write*: Heppenstall Co., Pittsburgh 1, Pa. *Phone*: Mayflower 1-2000

Tractor Welder

A self-powered welding unit mounted on this tractor makes it do double duty. Since it can pull or push up to 70 tons, it can tow construction materials to the job.

An International Harvester engine powers the tractor and 300 or 400-amp Lincoln generator. Optional equipment includes an all-

weather cab, an acetylene and oxygen tank bracket with cable reel, snowplow and rotary sweeper broom. *Write*: United Boiler Heating & Foundry Co., Hammond, Ind. *Phone*: Sheffield 65

Deburring Machine

The universal Burr-Master deburrs and chamfers internal splines, straight-sided or involute helical and spur gears ranging in size from 2 to 20-in. pitch diameter, with a maximum of 4 diametral pitch.

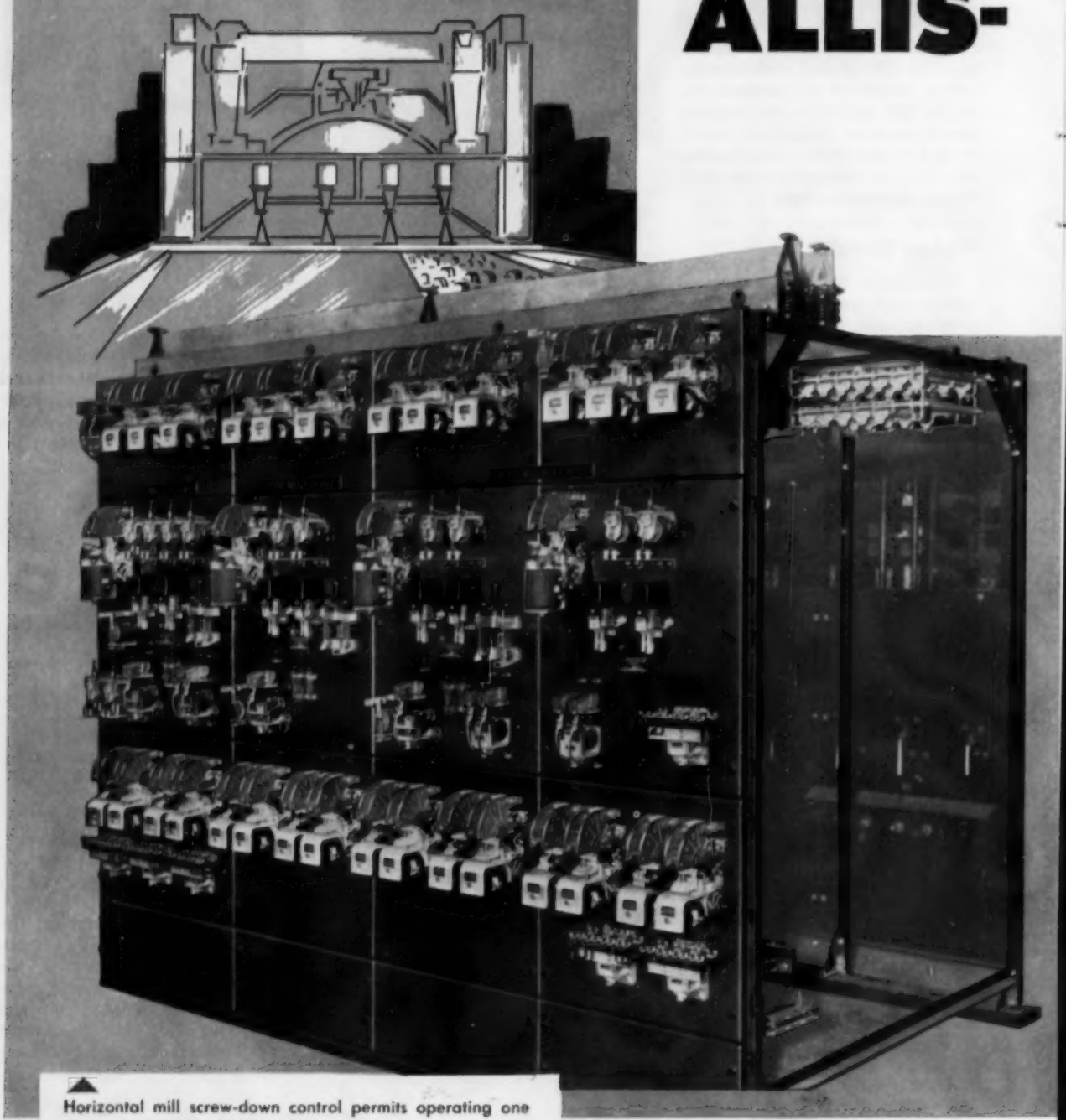
Throat clearance permits the handling of parts up to 22 in. OD. For high volume production, the machine can be supplied with automation. *Write*: Modern Industrial Engineering Co., 14230 Birwood Ave., Detroit 38, Mich. *Phone*: Webster 3-7280

Valve Lubricant

Rockwell-Nordstrom No. 555, multipurpose lubricant has an efficient temperature range of −40 to 500°F in bulk form and −20 to

STEEL MILL AUXILIARY CONTROL

Engineered ALLIS-



Horizontal mill screw-down control permits operating one motor for two screws through clutches. Horizontal mill housing adjustment panel is a reversible dynamic braking controller. Vertical mill roll adjustment panels permit operating two motors in unison or individually.

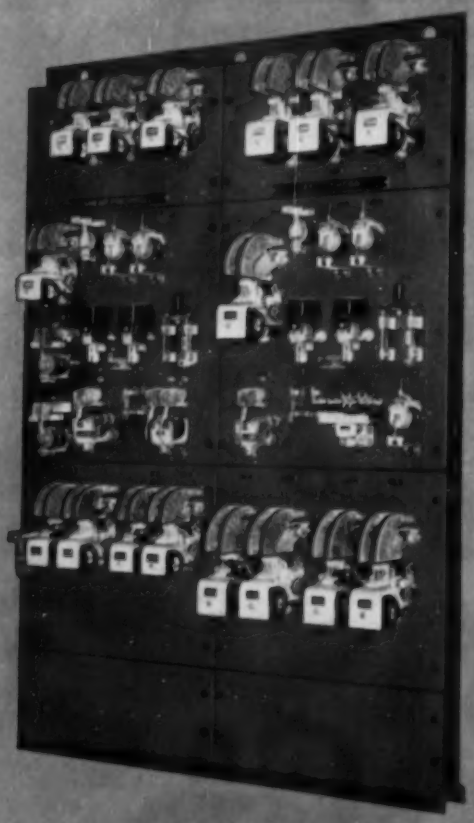
ALLIS-

and Built by CHALMERS

INSTALLED in some of the nation's largest mills, these Allis-Chalmers mill auxiliary controls are providing smooth, precision performance . . . affording maximum production with a minimum of outage time and maintenance.

When you modernize or expand, take advantage of Allis-Chalmers experience and engineering skill in building steel mill control. For further information see your Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wis.

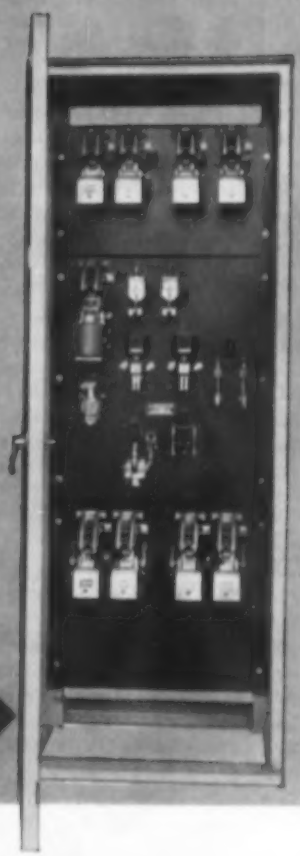
A-4744



Motor control for hydraulic feed pumps. Non-reversible with field accelerating and field decelerating relays.

Two reversible controllers with dynamic braking and series brake for an upcut shear and shear pinch roll.

Reversible dynamic braking controller for roll conveyor. Operates at two speeds in either direction.



A-C ALLIS-CHALMERS

CHALMERS

(Advertisement)

A SPECIAL REPORT ON PROTECTIVE FINISHES FOR ALUMINUM

Most aluminum producers and fabricators are well aware of the superiority of chemical finishes over anodizing for the protection of aluminum from corrosion. Naturally, then, there is a running battle for acceptance among the leading producers of the protective chemical finishes.

That's why, here at Allied, we have always studied your needs with regard to both our own and competitive processes. We're constantly trying to produce new and better finishes because we believe there's always room for improvement . . . even to our own products. Some years ago this policy led to the introduction of a process, long in development, that offered you a way to overcome anodizing's obvious technical complications . . . Iridite #14. This finish was far easier to use than anodizing, yet provided comparable, if not superior, quality. And, its cost was much less than anodizing.

But other finishes offering similar advantages over anodizing have entered the market. So . . . the current battle for acceptance. By any cost comparison Iridite #14 is the most economical. However, corrosion tests by users show contradictory results as to performance from Iridite #14 and other leading protective finishes for aluminum. Most tests show Iridite #14 superior, but some do not. The margin of difference, however, is always small. The truth is that all have proved good. However, our laboratory research indicated that still further improvements could be made.

That knowledge . . . plus our aim to give you even better protection and maintain the leadership of the industry, is exactly why Allied Development Engineers have been working for long years to develop a better finish than any of those now available, including our own Iridite #14.

Now the new finish is ready for you. It's called Iridite #14-2 (Al-Coat).

From a performance standpoint, Iridite #14-2 gives you two important advantages in the protective finishing of aluminum.

FIRST: in its fully colored brown film stage it provides corrosion resistance decidedly superior to previous processes.

SECOND: the basic brown film can be hot water bleached to produce a clear-type film with protection heretofore unobtainable from clear-type chemical finishes.

From an operating standpoint, new Iridite #14-2 gives you three important advantages.

FIRST: it provides consistently higher corrosion resistance for different aluminum alloys treated in the same bath.

SECOND: it provides a more uniform appearance for parts of different alloys and with varied surface finishes before treatment.

THIRD: its operating and technical characteristics are superior to those of other processes.

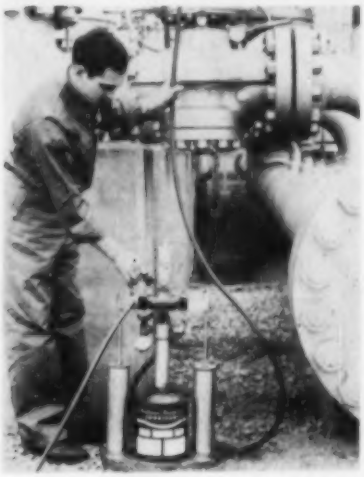
If you are using or planning to use a chemical finish for aluminum, you should have full details on new Iridite #14-2. Write us or send samples for free test processing. Or, for more immediate advice, call your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book. - - - ALLIED RESEARCH PRODUCTS, INC., 4004-06 EAST MONUMENT STREET, BALTIMORE 5, MARYLAND.

P. S. Even new Iridite #14-2 will be constantly measured against both your needs and competitive processes to make sure you get the best possible, most economical finish for your product that man and the laboratory can develop.

NEW PRODUCTS and equipment

500°F in stick form.

Recommended for hydrocarbon liquid and gas service, No. 555 is usually resistant to mixtures of



hydrocarbons in both acid and alkaline solutions. *Write:* Meter & Valve Division, Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa. *Phone:* Churchill 1-8400

Gear Shaver

The Model GCU-18-in. machine shaves spur and helical gears having 2¼ to 18-in. pitch diameter and 4 to 16 diametral pitch teeth by either diagonal or conventional

processes. The machine can be equipped with automatic upfeed and a mechanism to permit crown shaving operations. *Write:* National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. *Phone:* Walnut 1-8980

NEW Literature

Write directly to the company for a copy

Mechanical Seal

The Garlock BB-21A Mechanipak is designed for use on rotary shafts at pressures up to 150 psi—bulletin AD-150, 8 pages. Garlock Packing Co., Palmyra, N. Y.

Air-Cooled Compressor

The two-stage, Type-40 Motorcompressor, which develops 80 to 125 psi, is described—form 3188, 4 pages. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Diatomaceous Water Filters

Standard sizes with porous stainless steel filter elements to handle 8 to 939 gpm are described—release 214, 2 pages. Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y.

Hydraulic, Pneumatic Valves

Described are selector, restrictor, sequence, check and shut-off valves—bulletin 155, 34 pages. Aircraft Products Co., 300 Church Rd., Bridgeport, Pa.

Venturi Gas Scrubbers

Features and the operation of these units are described and applications given—bulletin M-103, 6 pages. Chemical Construction Corp., 525 W. 43rd St., New York 36, N. Y.

Positioners

Seven points for consideration in the selection of positioners for welding, coating, surfacing, chipping and other operations are outlined—bulletin R-1700-B15, 8 pages. Advertising & Sales Promotion Dept., Worthington Corp., Harrison, N. J.

Hydraulic Production Presses

Description and specifications of Elmes Hydrolairs are given—bulletin 1036-B, 8 pages. Elmes Engineering Division, American Steel Foundries, Cincinnati 29, O.

Phosphating Compounds

"A Better Bond for Organic Finishes" describes the Turcoat line. Turco Products Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

Metal Treating Reprints

"Application of Nitriding to Hot Forging Dies," 4 pages, and "How To Avoid Heat Treating Difficulties through Correct Design of Press Tools," 8 pages, are offered. Metal Treating Institute, 271 North Ave., New Rochelle, N. Y.

Piping Systems

"True Piping Economy" compares wrought iron and other types of pipe in terms of purchase, installation and maintenance costs—8 pages. Advertisement Dept., A. M. Byers Co., Pittsburgh, Pa.

Flexible Pipe Connections

"ExpandZorber" describes this line of stainless steel, welded diaphragm-type, packless expansion joints—catalog EZ-55, 12 pages. Industrial Division, T. R. Finn & Co., Hawthorne, N. J.

Self-Locking Nuts

Here is a catalog of engineering data, specifications and prices—24 pages. National Machine Products Co., 44225 Utica Rd., Utica, Mich.

Production Facilities

Listed are this company's facilities to mass produce gears—24 pages. Foote Bros. Gear & Machine Corp., 4545 S. Western Blvd., Chicago, Ill.

Alkaline Detergent

Described is a new method of removing paint, phosphate coatings, rust and oil from metal surfaces. Oakite Products Inc., 134E Rector St., New York 6, N. Y.

Powdered Metal Bearings

Dimensions and ordering code numbers for more than 1000 commercial bearing sizes are given—30 pages. Powdered Metals Division, Keystone Carbon Co., St. Marys, Pa.

Cast Iron Products

Described is the Refax line of melting and holding pots for foundries, diecasting operations, battery plants and smelting works—4 pages. ACF Industries Inc., 30 Church St., New York 8, N. Y.

Machine Components

Covered are hydraulic drill units, automatic cam feed drilling units, lead screw tapping units, multiple spindle heads, automatic index tables and machine bases—20 pages. Hartford Special Machinery Co., 294 Homestead Ave., Hartford 12, Conn.

Magnesium, Aluminum Castings

A practical guide to the design and specification of sand and permanent mold castings and diecastings is offered in a pocket-sized booklet. Rolle Mfg. Co., Third and Cannon Ave., Lansdale, Pa.

Cemented Carbide Tools

Described is this company's line of carbide tooling, blanks and inserts—catalog 55, Kennametal Inc., Latrobe, Pa.

COPPER DETERMINATION

Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical CONTROL for the production of low alloy steel and gray iron

Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, ALLOYMET 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

For further information, write us for our booklet, "Master Alloys."

*Nominal Chemical Composition

ALTER COMPANY
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2561 Teletype DV 588

STEEL

June 27, 1955

Market Outlook

DEMAND for steel and other metals will continue strong in the last half if that period shapes up like the metalworking industry thinks it will.

Metalworking companies expect their sales volume to rise 2 per cent in the next six months, STEEL's Midyear Business Conditions survey shows. That increased pace, along with a fast first half, will put the metalworking industry's sales for the year at $120 billion, up 9.1 per cent over 1954 and only 4 per cent below record 1953.

ROSY PICTURE—The steel industry winds up the first half on a high note: Ingot production at 97 per cent of capacity, and a house full of orders. On some products, steel producers are booked full for the third quarter and are entering orders for fourth quarter. Even though national ingot output has averaged 95.8 per cent of capacity in the second quarter, some producers have been unable to keep up with the influx of orders.

ADDED SUPPORT—Lending buoyancy to the second-half outlook is the upward revision in the estimate of new construction. The government calculates this year's total will be a record $41.8 billion, up 5.8 per cent over its earlier estimate and 11 per cent above record 1954's $37.6 billion. Construction is the second largest user of steel.

REVIVAL—Railroads at last are showing life in their buying. For the second consecutive month, orders for freight cars rose. The May total was 3041 cars; April's, 2706. The New York Central is inquiring for 3000 fifty-ton box cars. That's almost as many freight cars as were ordered by all of the roads in May. The Southern Railroad will buy 1500 hopper cars, and there is an unverified report the Pennsylvania Railroad is thinking about buying 10,000 freight cars. Meanwhile, awards are more numerous than they were, the largest involving 905 freight cars for the Chicago & North Western.

WHAT IT MEANS—An upturn in freight car orders will make demand for sheared steel plates even tighter than it is. Railroad buying is not likely to include much rail. After July, tracklaying will be slowing down seasonally.

Because business has picked up, some foundries will not shut down for summer vacations and others will suspend operations for only one week instead of two.

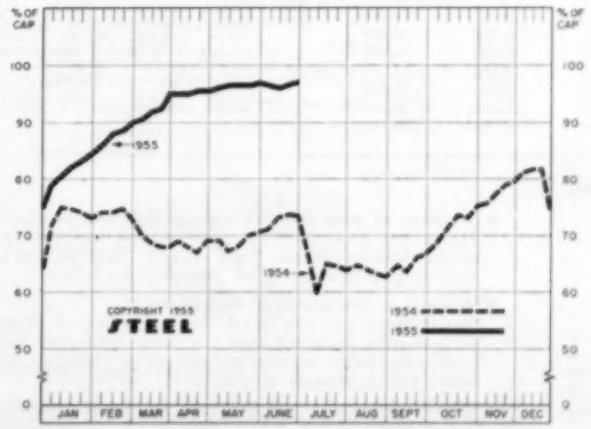
CONTRACTION—The biggest user of steel—the automobile industry—plans to reduce its consumption in the third quarter. That industry's scheduled production of passenger autos in the third quarter is 26 per cent below second-quarter output.

Even so, steel demand will be strong enough at the beginning of the third quarter to make it relatively easy for the steel companies to pass on expected price increases.

FASTER—Production of steel for ingots and castings was at 97 per cent of capacity in the week ended June 26, after rising 0.5 point over the preceding week. Once before this year—in May—a 97-per-cent rate was attained.

Output of steel for ingots and castings in the first half of this year will total 57.4 million net tons, exceeded only by the 57.9 million tons in 1953's first half.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended June 26	Change	Same Week 1954	Same Week 1953
Pittsburgh	101	+ 1	72.5	97.5
Chicago	98.5	+ 1*	82.5	103
Mid-Atlantic	96.5	+ 1	57	98
Youngstown	98	0	72	105
Wheeling	96	+ 0.5	87	100
Cleveland	101.5	+ 1.5	69	98.5
Buffalo	104.5	0	67.5	106.5
Birmingham	93.5	0	76	101
New England	92	0	50	85
Cincinnati	87.5	+ 0.5	69	104
St. Louis	106	0	73.5	99
Detroit	97.5	+ 4.5	51.5	105
Western	108	0	85	107
National Rate	97	+ 0.5	73	99

INGOT PRODUCTION‡

	Week Ended June 26	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	146.3†	144.2	144.8	107.1
NET TONS (In thousands)	2,350†	2,316	2,326	1,720

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 31

Technical Outlook—p. 79

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	June 21 1955	June 14 1955	Month Ago	May Average
(1947-1949=100)	144.9	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 21

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525	Sheets, Electrical	$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axles, Railway	7.500	Strip, H.R., Carbon	5.075
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv., Buttweld (100 ft)	18.605
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.218
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227.875
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	‡
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	‡
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stainless, 304 (100 ft)	167.023
Bars, H.R., Stainless, 302 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.943	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.160	Wire, Drawn, Carbon	8.075
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.435	Bale Ties (bundle)	5.560
Sheets, H.R., Carbon	4.870	Nails, Wire, 8d Common	7.815
Sheets, C.R., Carbon	5.864	Wire, Barbed (80-rod spool)	7.139
Sheets, Galvanized	7.290	Woven Wire Fence (20-rod roll)	16.925

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	June 22 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.75	156.56
Index in cents per lb	5.270	5.270	5.270	5.140	4.242

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.20	$94.36
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	35.25	35.00	34.67	27.83	39.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 22 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld., Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, 7/32-½" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$34.50	$34.50	$34.50	$29.50	$45.00
No. 1 Heavy Melt, E. Pa.	37.25	36.50	35.50	23.00	35.25
No. 1 Heavy Melt, Chicago	34.00	34.00	34.00	31.00	37.50
No. 1 Heavy Melt, Valley	34.50	34.50	34.50	28.50	42.50
No. 1 Heavy Melt, Cleve.	31.50	31.50	31.50	27.50	40.50
No. 1 Heavy Melt, Buffalo	29.50	29.50	29.50	26.50	39.75
Rails, Rerolling, Chicago	51.50	51.50	51.50	44.50	47.50
No. 1 Cast, Chicago	41.50	41.50	40.50	38.50	44.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	16.75	15.50
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

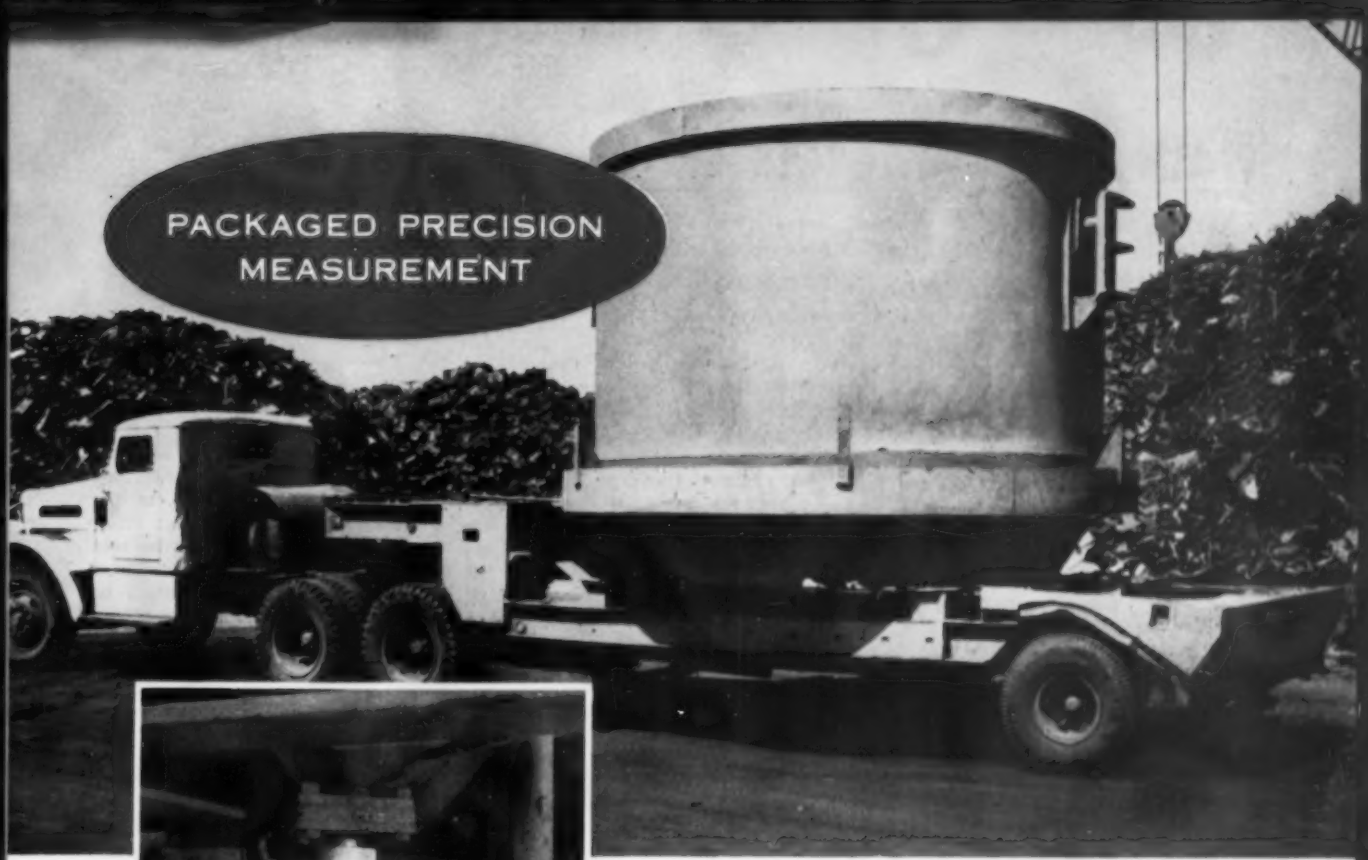
Daily Nonferrous Price Record

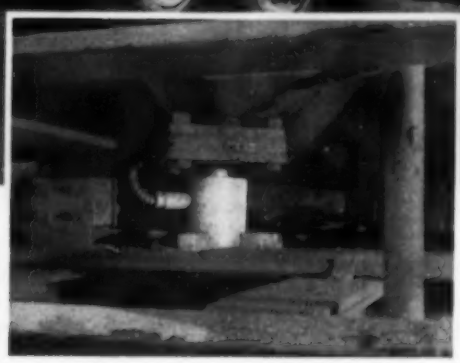
	Price June 22	Last Change	Previous Price	May Avg.	Apr. Avg.	June 1954 Avg.
Copper	38.00	Mar. 29, 1955	33.00	38.000	38.000	30.000
Lead	14.80	Oct. 4, 1954	14.85	14.800	14.800	13.906
Zinc	13.00	Apr. 6, 1955	11.50	12.000	11.927	10.923
Tin	94.50	June 16, 1955	93.75	91.410	91.458	94.178
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**





SR-4® Load Cells cut handling time by weighing scrap anywhere in yard

Baldwin's "Packaged Precision Measurement" can help you lower the cost of handling all heavy materials.

That's being demonstrated in this scrap steel yard of a large steel mill. Baldwin's SR-4 Load Cells, installed under loading buckets, have reduced greatly the time required to load the scrap steel and move the buckets on to electric furnaces.

Here's how. Each truck is fitted with four SR-4 Load Cells supporting the scrap hopper (see smaller photo). Continuous, accurate weight is provided by a Baldwin Type 5 Precision Indicator mounted on the trailer in a steel housing, powered by batteries through an inverter.

This system is much more flexible than the previous method. The previous one had wasted a lot of time because it was necessary to move the scrap load to a scale car on tracks that could only move back and forth under an overhead crane.

Thanks to Baldwin's "Packaged Precision Measurement," scrap charge load weights (upwards of 50 tons each now) are checked instantly on the indicator during loading operations *anywhere in the yard*. The exact amount of scrap needed is in the bucket when it leaves the scrap yard.

SR-4 devices are ruggedly built to withstand severe impacts and overloads. Their exceptionally high accuracy does not change with age. There are no moving parts to wear out. There's no hydraulic system to control. For detailed information about SR-4 device applications and instrumentation, write us or use the coupon right away.

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- ☐ Bulletin 4300 (Introduction to SR-4 Devices)
- ☐ Bulletin 4301 (SR-4 Load Cells and Load Beams)
- ☐ Bulletin 4304 (SR-4 Crane Scales)
- ☐ Bulletin 4302 (SR-4 Weighing of Tanks, Bins, Hoppers)

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Nonferrous Metals

Industry takes initiative in third round of aluminum expansion. If proposed plans were to materialize, new capacity would exceed second-round figures

Nonferrous Metals Prices, Pages 116 & 117

IT'S A GOOD BET that this time the new "third round of expansion" in the aluminum industry is going to produce something more than just another folder for the dead-letter file. And it will be largely on the initiative of industry, not government.

At best, the end result could be about 311,000 tons of new capacity. That's the total of all publicly announced proposals by new and present producers. It's made up as follows: Aluminum Co. of America, 45,000 tons at Rockdale and 20,000 tons at Point Comfort, Tex.; Reynolds Metals Co., 25,000 tons at Sheffield, Ala.; Kaiser Aluminum & Chemical Corp., 5000 tons at Tacoma, Wash., and 90,000 tons at an undetermined site; St. Joseph Lead Co. and Pittsburgh Consolidation Coal Co., 66,000 tons in Pennsylvania; Olin Mathieson Chemical Corp., 60,000 tons at an undetermined site. In addition, Harvey Aluminum Co. still holds a certificate of necessity granted during the defunct third round, but it has not indicated recently an intention to do anything about it.

Tops Second Round—If all this were to materialize, it would exceed substantially the second round, which added about 245,000 tons of capacity. But even if only the Big Three were to go ahead, the total would be 189,000 tons, just 25,000 tons short of the old third round goal. Right now, this is problematical, inasmuch as Kaiser has only applied for the certificate of necessity and has made no final decisions.

The rest of the expansion is even less definite. Applications are on file for certificates, which is merely the first phase of planning. (It should be remembered that Olin had a certificate for a 110,000-ton plant before but never did anything with it.) Early in July, the Office of Defense Mobilization is expected to clear up the picture. The ODM staff is studying the situation to determine: 1. Whether the current tight market is the result of inventory build-up or a true indication of a growing demand that will continue to tax present capacity? 2. What incentives, if any, other than fast tax write-offs should the government offer producers? To date, none of the applicants has mentioned any other aid, although they might seek guaranteed five-year purchase contracts. Most observers believe no government financing will be asked for or offered.

Good Chance—Unless the plans of the applicants fail to meet government requirements, at least one Washington official sees no reason why they will not get their certificates of necessity.

As for the future of the industry, there is no question in the minds of producers. They are a confident group of businessmen. They admit that some of the current demand is for inventory. One official estimated that roughly 30 to 40 per cent of what customers are *asking for* could be for inventory, but only about 15 per cent of what they are *getting* goes to stocks, which are in need of building up. But use is increasing all the time, and by the time any proposed expansion gets into production, the demand will absorb a good part of the new metal.

Sound Advice—At least one producer cautioned the government against premature scrapping of the third round in the first place. Even late last year, one company advised the government either to permit further expansion or suspend aluminum stockpiling for this year. The reasoning was that the government got a windfall in its purchases during slack 1954 and would not suffer in the long run by giving up its 1955 take. The fact that the government has released 175,000 tons of aluminum during second and third quarters of this year indicates that the advice was sound.

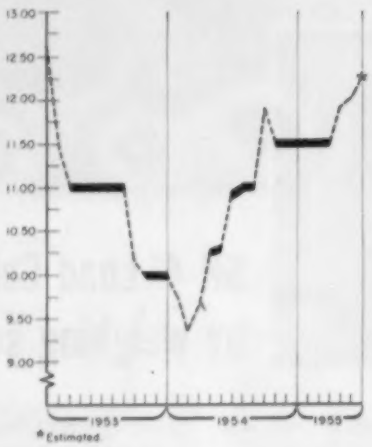
This release of metal will definitely help the industry, in the opinion of most industry men, if it is distributed equitably. By this they mean that it should not all be sold to independent users in the form of pig and ingot, but some should be reserved for processing into semi-finished forms for customers that require it. This segment of the industry was neglected in the second-quarter diversion. However, ODM Director Flemming says there will still be a shortage in third quarter because demand is greater than supply by 18,000 tons.

Who's Protecting Producers?—The Yates subcommittee in the House conducted additional hearings last week aimed at protecting the interests of small businesses. The results were not known at presstime. But from responses to the committee's inquiries to producers earlier this month, it seemed certain that nonintegrated businesses would get most, if not all, of the released metal in the second half.

Zinc's Major Price Plateaus

STEEL's Monthly Averages

(cents per pound)



Market Memos

• In a speech before the American Electroplaters' Society, Simon D. Strauss, vice president of American Smelting & Refining Co., said that of the four metals with which he is most familiar—zinc, copper, cadmium and silver—only the last looks like it will have long-range supply problems. Industry currently is using more of the metal than is being supplied through mining activities.

• At the meeting of another association in Washington earlier this month, there was much talk about the "black market" springing up in copper. The convention goers were complaining about the 45-cent premium price being demanded by such sources. One primary producer said: "We are aware of this gouging, but we cannot do anything about it. We sell at a contract price of 36 cents. There's nothing the government can do either." Evidently there are some who don't object too strenuously, because the high-priced metal is moving.

Illustration shows automatic batch type Chip Wringer in large automotive plant.

Are you satisfied with your cutting oil recovery rate?

Like any other machinery, cutting oil recovery equipment can become obsolete. Modern chip wringers with automatic conveyors have changed the picture radically. So perhaps it's time for you to ask yourself these questions:

- **Are you certain you are recovering all the oil possible from your machining operations?**
- **Can one man handle your entire chip wringing operation?**
- **Are you positive that your equipment is adequate to insure maximum efficiency and economy?**

Unless you can answer all of these questions in the affirmative you'll find it worthwhile to get the facts about modern chip wringing methods. The best way to do this is to talk with an experienced Tolhurst engineer. He will gladly make a survey of your operation . . . give you an estimate of the savings you can make with modern Tolhurst equipment . . . show you how quickly it will pay for itself . . . cite actual examples of savings made by dozens of plants, large and small.

Tolhurst Centrifugal Chip Wringers are available in 3 models and 6 sizes. Capacities range from 1.25 to 15.5 cubic feet per load. Small models load and unload manually. Larger models are automatic batch type and can be furnished with loading and unloading conveyors.

Get the facts now. Talk things over with a Tolhurst engineer. There's no obligation. Just clip and mail the coupon.

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Company_____

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Specialists in Liquid-Solids Separation

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$100 nom, per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.35 for ingots; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, O and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $281-$283 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $20-$21 per troy oz.

Platinum: $77-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 89.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 94.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.2% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.60 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.50; brass special, 12.75; intermediate, 13.00, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.85; special high grade, 14.00. Diecasting alloy ingot No. 3, 16.50; Nos. 2 and 5, 17.00.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 26.25-27.50; No. 12 foundry alloy (No. 2 grade), 25.50; 5% silicon alloy, 0.60 Cu max, 27.25-28.00; 13 alloy, 0.60 Cu max, 27.25-28.00; 195 alloy, 27.50-28.00; 108 alloy, 26.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.50-27.25; grade 2, 25.50-26.25; grade 3, 24.50-25.25; grade 4, 24.00-24.75.

Brass Ingot: Red brass No. 115, 34.50; tin bronze No. 223, 45.00; No. 245, 39.75; high-leaded tin bronze No. 305, 38.00; No. 1 yellow, No. 405, 29.25; manganese bronze No. 421, 31.75.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.00-20.50; plates, 19.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	103	153
Shot, Blocks	...	65	...

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circlet
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.8
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 99.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 15.00-15.50; old sheets, 12.00-12.50; borings and turnings, 8.50-9.00; crankcases, 12.00-12.50; industrial castings, 12.00-12.50.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f	
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Munts Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 32.50-33.50; No. 2 heavy copper and wire, 31.50-32.00; light copper, 29.50-30.00, No. 1 composition red brass, 25.00-26.00; No. 1 composition turnings, 24.50-25.50; yellow brass turnings, 15.00; new brass clippings, 21.50-22.00; No. 1 brass rod turnings, 19.50-20.00; light brass, 15.50-16.50; heavy yellow brass, 17.00-18.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 18.50-20.00; cocks and faucets, 19.50-20.50; brass pipe, 19.50-20.50.

Lead: Heavy, 11.50-12.00; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.50; electrotype, 12.00-12.50; mixed babbitt, 14.00-14.50.

Magnesium: Clippings 18.50-19.50; clean c. t-ings 18.00-19.00; iron castings, not over 1u % removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 38.00-39.00; old sheets, 33.00-34.50; turnings, 29.50; rods, 38.00-39.00.

Nickel: Sheets and clips, 80.00-90.00; rolled anodes, 80.00-90.00; turnings, 65.00-75.00; rod ends, 80.00-90.00.

Zinc: Old zinc, 5.00-5.50; new die-cast scrap, 5.00-5.25; old die-cast scrap, 3.50-3.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.50-19.00; 3003 clippings, 18.00-19.50; 6151 clippings, 18.00-19.00; 5052 clippings, 18.00-19.00; 2014 clippings, 17.50-18.50; 2017 clippings, 17.50-18.50; 2024 clippings, 17.50-18.50; mixed clippings, 17.00-19.00; old sheet, 15.00-16.00; old cast, 15.50-16.00; clean old cable (free of steel), 18.00-19.00; borings and turnings, 16.00-17.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.

Copper and Brass: No. 1 copper, 35.50-36.00; No. 2 copper, 34.00-34.50; light copper, 32.25-32.75; refinery brass (60% copper) per dry copper content, 30.50-31.75.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper, 35.25; No. 2 copper, 33.25-33.75; light copper, 31.00-32.00; No. 1 composition borings, 27.50-27.75; No. 1 composition solids, 28.00-28.25; heavy yellow brass solids, 20.00-21.00; yellow brass turnings, 19.00-20.00; radiators, 21.00-22.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled $1.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 96.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.135; 200-499 lb, $1.12; 500-999 lb, $1.115; 1000 lb or more, $1.11.

Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.

Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 1515. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 72.00; 100-600 lb, 57.60; 700-1900 lb, 55.20; 2000-9900 lb, 53.40; 10,000 lb or more, 52.30.

Stannous Chloride (Anhydrous): Less than 50 lb, $1.582; 50 lb, $1.242; 100-300 lb, $1.092; 400-900 lb, $1.068; 1000-1900 lb, $1.043; 2000-4900 lb, $1.006; 5000-19,900 lb, 94.60; 20,000 lb or more, 88.50.

Stannous Sulphate: Less than 50 lb, $1.281; 50 lb, 98.10; 100-1900 lb, 96.1; 2000 lb or more, 94.10.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

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Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 119. Key to footnotes, page 121.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$65.00
Houston S5 .....70.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 .....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 .....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2 ..64.00
LoneStar,Tex. L6 .....70.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 .....$78.00
Bessemer,Pa. U5 .....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 .....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....83.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Midland,Pa. C18 .....78.00
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 .....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....91.00
Ind.Harbor,Ind. Y1 ....86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R3 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
LoneStar,Tex. L6 .....4.30
Munhall,Pa. U5 .....3.90
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 .....3.90
Youngstown R3, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.475
Houston S5 .....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S6 ....4.925
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y. B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 ....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7....4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.30
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 .....5.00
Phoenixville,Pa. 4.20
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W8 .....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.25
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.45
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 .....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 .....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 .....4.225
Houston S5 .....4.270
Ind.Harbor,Ind. I-2, Y1..4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W8 .....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Coatesville,Pa. L7 .....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.50
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14..6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.46

PLATES, Alloy

Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14..5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 .....5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.275
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Bridgeport,Conn. N19 ..4.55
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
Joliet,Ill. P22 .....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Midland,Pa. C18 .....4.30
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ...5.05
So.Chicago R2,U5,W14 ..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W8 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 .....5.075
Canton,O. R2, T7.....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.175
Fontana,Calif. K1 .....6.125
FairlessHills,Pa. U5 ....5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1..5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2,U5,W14..5.075
So.Duquesne,Pa. U5 ....5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.P. Loaded Alloy

Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.P. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.70
Ind.Harb.,Ind. I-2, Y1 ..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.45
KansasCity,Mo. S5 ....5.45
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12,R2.5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.55
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R5 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 .....5.85
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2,M13..6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R5 ....6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ....6.925
Youngstown F3, Y1....6.625

BARS, C.F. Loaded Alloy

Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 .....7.70
Carnegie,Pa. C12 .....7.525
Chicago W18 .....7.525
Cleveland C20 .....7.525
Monaca,Pa. S17 .....7.525
Newark,N.J. W18 .....7.70
SpringCity,Pa. K3 .....7.70
Warren,O. C17 .....7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ...4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.55

Ind.Harbor, Ind. 1-2, Y1..4.30
Johnstown, Pa. B2 .....4.30
Joliet, Ill. P22 .....4.30
KansasCity, Mo. S5 .....4.55
Lackawanna, N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton, Pa. M18 .....4.30
Minnequa, Colo. C10 ....4.75
Niles, Calif. P1 .....5.00
Pittsburg, Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland, Oreg. O4 .....5.05
SandSprings, Okla. S5 ...4.80
Seattle B3, N14, P23 ...5.05
So.Chicago R2 .....4.30
So.Duquesne, Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint, Md. B2 ..4.30
Sterling, Ill. (1) N15 ....4.30
Sterling, Ill. N15 .....4.40
Struthers, O. Y1 .....4.30
Torrance, Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown, Pa. ¼-1" B2. .5.70
KansasCity, Kans. S5 ...6.50
LosAngeles B3 .....5.95
Marion, O. P11 .....5.55
Pittsburgh J5, U8 .....5.72
Seattle B3, N14, P23 ...6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ¼-1" B2 ..5.70
Williamsport, Pa. S19 ..5.60

RAIL STEEL BARS

Avis, Pa. (3) J8 .....4.25
ChicagoHts. (3) C2, I-2. .4.20
ChicagoHts. (4) C2, I-2. .4.30
Ft. Worth, Tex. (26) T4 ..4.75
Franklin, Pa. (3) F5 ....4.20
Franklin, Pa. (4) F5 ....4.30
Marion, O. (3) P11 .....4.20
Moline, Ill. (3) R2 .....4.30
Tonawanda (3) B12 ....4.15
Tonawanda (4) B12 ....4.30
Williamsport, Pa. (3) S19.4.30

BARS, Wrought Iron

Economy, Pa. (S.R.) B14 10.85
Economy, Pa. (D.R.) B14 13.50
Economy (Staybolt) B14 13.80
McK.Rks (S.R.) L5 ....10.85
McK.Rks. (D.R.) L5.... 14.75
McK.Rks. (Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City, Ala. R2 .....4.05
Allenport, Pa. P7 .....4.05
Ashland, Ky. (8) A10 ....4.05
Cleveland J5, R2 .....4.05
Conshohocken, Pa. A3 ...4.10
Detroit (8) M1 .....4.15
Dravosburg, Pa. U5 ....4.05
Ecorse, Mich. G5 .....4.15
Fairfield, Ala. T2 .....4.05
FairlessHills, Pa. U5 ....4.10
Fontana, Calif. K1 ....4.825
Gary, Ind. U5 .....4.05
Geneva, Utah C11 .....4.15
GraniteCity, Ill. G4 ....4.25
Ind.Harbor, Ind. I-2, Y1..4.05
Kokomo, Ind. C16 .....4.15
Lackawanna, N.Y. B2 ...4.05
Mansfield, O. E6 (37) ...4.05
Mansfield, O. E6 (38) ...4.80
Munhall, Pa. U5 .....4.05
Newport, Ky N9 .....4.05
Niles, O. N12 .....4.05
Pittsburg, Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth, O. P12 ....4.05
Riverdale, Ill. A1 .....4.05
Sharon, Pa. S3 .....4.05
So.Chicago, Ill. W14 ....4.05
SparrowsPoint, Md. B2 ..4.05
Steubenville, O. W10 ....4.05
Warren, O. R2 .....4.05
Weirton, W.Va. W8 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City, Ala. R2 .....5.35
Kokomo, Ind. C16 .....5.20
Niles, O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor, Ind. Y1 ....6.70
Youngstown Y1 .....6.70

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken, Pa. A3 ...6.15
Dravosburg, Pa. U5 ....6.10
Ecorse, Mich. G5 .....6.20
Fairfield, Ala. T2 .....6.10
FairlessHills, Pa. U5 ....6.15
Fontana, Calif. K1 ....6.875
Gary, Ind. U5 .....6.10
Ind. Harbor, Ind. I-2, Y1.6.10
Lackawanna (35) B2 ....6.10
Munhall, Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon, Pa. S3 .....6.10
So. Chicago, Ill. U5 .....6.10
SparrowsPoint (36) B2 ..6.10
Warren, O. R2 .....6.10
Weirton, W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland, Ky. (8) A10 ....4.30
Cleveland R2 .....4.65
Ind. Harbor, Ind. I-2 ....4.30
Warren, O. R2 .....4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport, Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken, Pa. A3 ...5.00
Dravosburg, Pa. U5 ....4.95
Ecorse, Mich. G5 .....5.05
Fairfield, Ala. T2 .....4.95
FairlessHills, Pa. U5 ....5.00
Follansbee, W.Va. F4 ...4.95
Fontana, Calif. K1 .....4.95
Gary, Ind. U5 .....4.95
GraniteCity, Ill. G4 ....5.15
Ind. Harbor, Ind. I-2, Y1.4.95
Lackawanna, N.Y. B2 ...4.95
Middletown, O. A10 ....4.95
Newport, Ky. N9 .....4.95
Pittsburg, Calif. C11 ....5.00
Pittsburgh J5 .....4.95
Portsmouth, O. P12 ....4.95
SparrowsPoint, Md. B2 ..4.95
Steubenville, O. W10 ....4.95
Warren, O. R2 .....4.95
Weirton, W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Dravosburg, Pa. U5 ....7.50
Ecorse, Mich. G5 .....7.60
FairlessHills, Pa. U5 ....7.55
Fontana, Calif. K1 .....8.55
Gary, Ind. U5 .....7.50
IndianaHarbor, Ind. Y1 ..7.50
Lackawanna (37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint (38) B2 ..7.50
Warren, O. R2 .....7.50
Weirton, W.Va. W8 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Middletown, O. A10 ....5.45

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland, Ky.	A10.6.50	....
Canton, O.	R2 ...6.50	7.10
Dravosburg	U5 ..5.70	....
Fairfield	T2 ....5.70	....
Gary, Ind.	U5 ....5.70	5.95
Ind.Harbor	I-2 ..5.70	5.95
Kokomo, Ind.	C16.5.80	....
MartinsFry.	W10.5.70	....
Newport, Ky.	N9..5.70	5.95
Pitts., Calif.	C11..6.45	....
SparrowsPt.	B2 ..5.70	....

SHEETS, Culvert—Pure Iron

Ashland, Ky A10 .....6.75
Gary, Ind. U5 .....5.95
MartinsFerry, O. W10 ...5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City, Ala. R2 .....5.45‡
Ashland, Ky. A10 .....5.45*
Butler, Pa. A10 .....5.45†
Canton, O. R2 .....5.45‡
Delphos, O. N16 .....6.10‡
Dover, O. R1 .....5.45‡
Dravosburg, Pa. U5 ...5.45†
Fairfield, Ala. T2 .....5.45†
Gary, Ind. U5 .....5.45*
GraniteCity, Ill. G4 ....5.80‡
Ind.Harbor, Ind. I-2 ...5.45†
Kokomo, Ind. C16 .....5.55‡
MartinsFerry, O. W10 ..5.45*
Middletown, O. A10 ....5.45†
Newport, Ky. N9 .....5.45‡
Niles, O. N12 .....5.45‡
Pittsburg, Calif. C11 ..6.20°
SparrowsPt., Md. B2 ...5.45‡
Steubenville, O. W10 ....5.45‡
Warren, O. R2 .....5.45†
Weirton, W.Va. W6 ....5.45°

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana, Calif. K1 ....6.325

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg, Pa. U5 ....5.30
SparrowsPoint (30) B2 ..5.30

SHEETS, Galvannealed Steel

Canton, O. R2 .....5.95
Dravosburg, Pa. U5 ....5.85
Kokomo, Ind. C16 .....6.20
Newport, Ky. N9 .....5.85
Niles, O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland, Ky. (8) A10 ....5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland, Ky. A10 .....5.70
Butler, Pa. A10 .....5.70
Middletown, O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland (28) R2 .....6.30
Niles, O. (28) R3 .....6.30
Weirton, W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler, Pa. A10 .....8.635

SHEETS, Enameling Iron

Ashland, Ky. (8) A10 ...5.375
Cleveland R2 .....5.375
Dravosburg, Pa. U5 ...5.375
Gary, Ind. U5 .....5.375
GraniteCity, Ill. G4 ....5.575
Ind. Harbor, Ind. I-2 ...5.375
Middletown, O. A10 ....5.375
Niles, O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 Gage

Follansbee, W.Va. F4 ..7.375
Follansbee (23) F4 .....6.60
Yorkville, O. W10 .....7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom, W.Va. W10 5.85
Gary, Ind. U5 .....5.85
Mansfield, O. E6 .....5.85
Middletown, O. A10 ....5.85
Niles, O. N12 .....5.85
Weirton, W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown, O. A10 ....6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C3 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F8 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest. SteelRoll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv., EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T3 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn. N19	4.35
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R3	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.00
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Ind.Harbor,Ind. Y1	6.70
LosAngeles B3	7.90
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.40
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R3	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit D2, M1, P30	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.50
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S18	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S18	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W2	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.25	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.90	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.00	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R3	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed 1½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425	8.95*	9.55	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25‡	9.85‡	10.85‡	11.75‡
Vandergrift,Pa. U5	8.225	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	15.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.00	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed, semiprocessed ½c lower. §Coils, ¾-cent higher.

STRIP, Electrogalvanized	
Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.55*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

STRIP, Cold-Rolled	
Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	8.425
Warren,O. R2	8.60
Weirton,W.Va. W6	8.60
Youngstown Y1	8.60

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (128-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE,American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R3	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	7.85
Gary,Ind. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	5.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.95
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No. Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.85
Waukegan,Ill. A7	11.20
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.65
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	145
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Hot Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$8.77
Buffalo W12	8.77
Donora,Pa. A7	8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Minnequa,Colo. C10	9.02
So.Chicago,Ill. R2	8.77
Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.05
Buffalo W12	9.05
Donora,Pa. A7	9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Minnequa,Colo. C10	9.30
So.Chicago,Ill. R2	9.05
Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.10
Buffalo W12	9.10
Donora,Pa. A7	9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10
Minnequa,Colo. C10	9.35
So.Chicago,Ill. R2	9.10

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	158
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburgh,Calif. C11	179
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156‖
Atlanta A11	164
Bartonville,Ill. K4	165
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161††
Minnequa,Colo. C10	164**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
So.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	163

WOVEN Fence, 9-15 Ga.

	Col.
Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149‖
Atlanta A11	151
Bartonville,Ill. K4	152
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	151**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	150

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	----
Cleveland A7	13.15	----
Crawf'dsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	----

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	6.90	7.30**
Aliquippa J5	6.90	7.425‖
Atlanta A11	7.00	7.55
Bartonville(48) K4	7.00	7.575
Buffalo W12	6.90	7.30†
Cleveland A7	6.90	----
Crawfordsville M8	7.00	7.55
Donora,Pa. A7	6.90	7.30†
Duluth,Minn. A7	6.90	7.30†
Fairfield T2	6.90	7.30†
Houston,Tex. S5	7.15	7.55†
Jacks'ville,Fla. M8	7.425	7.95
Johnstown B2(48)	6.90	7.45*
Joliet,Ill. A7	6.90	7.30†
KansasCity,Mo. S5	7.15	7.55†
Kokomo C16	7.00	7.40†
LosAngeles B3	7.85	----
Minnequa C10	7.15	7.55**
Monessen P7 (48)	6.90	7.45
Palmer,Mass. W12	7.20	7.60†
Pitts.,Calif. C11	7.85	8.25†
Portsmouth,O. P12	6.90	----
Rankin A7	6.90	7.30†
So.Chicago R2	6.90	7.30**
So.S.Fran. C10	7.85	8.25**
Spar'wsPt.B2(48)	7.00	7.55*
Sterling(1)(48)	N15 6.90	7.475
Struthers,O.(48)	Y1 6.90	7.40†
Worcester,Mass.	A7 7.20	----

*Based on 11c zinc; †5c zinc; ‖10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅞" to 1¼", inclusive	58
1⅜" to 1½", inclusive	60
1⅝" and larger	65
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅞" to 1¼", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	56

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37½

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.50
2⅝	12	38.15	45.74	37.00
2⅞	12	41.31	49.53	40.07
3	12	44.06	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Too Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...(16)	5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	6.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.50
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Cariots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	33.00-43.00†
Bronze, 5000-lb lots	54.25-57.25†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	49.75-57.25
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	17.75-31.50‡
Tungsten Melting grade, 99% 60 to 200 mesh	Dollars 4.30-4.40
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅝" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Dedd San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 10 mesh.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c. H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; dedd. to mill same or within switching limits, 5.10c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.66		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	....	20	....	21.5	....	21.5	....	20.75	....	23.25	....
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		9c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	....	....	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Etna, Pa. N2	....	....	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	....	....	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	....	....	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	....	....	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	....	....	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+2.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Sharon, Pa. M6	....	....	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R3, Y1	....	....	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.66		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	28.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	28.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R3, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.20	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
16-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	....	24.50	25.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	35.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Josiyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.90	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.09	35.30	34.25
347	32.20	38.80	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base—Cold Rolled 10%	Strip, Carbon Base—Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S15.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.8	12.25	....	4.030
18.25	4.25	1	4.75	....	2.245-2.415
18	4	2	9	....	2.615
18	4	2	....	....	1.705
18	4	1	....	....	1.540
14	4	2	5	....	2.185
13.75	3.75	2	5	....	2.185
13.5	4	3	....	....	1.805
9	3.5	..	....	....	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A5, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	57.50
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Chester,Pa. C31	....	53.50	54.00	....
Philadelphia, deld.	....	55.16	55.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grads. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$66.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

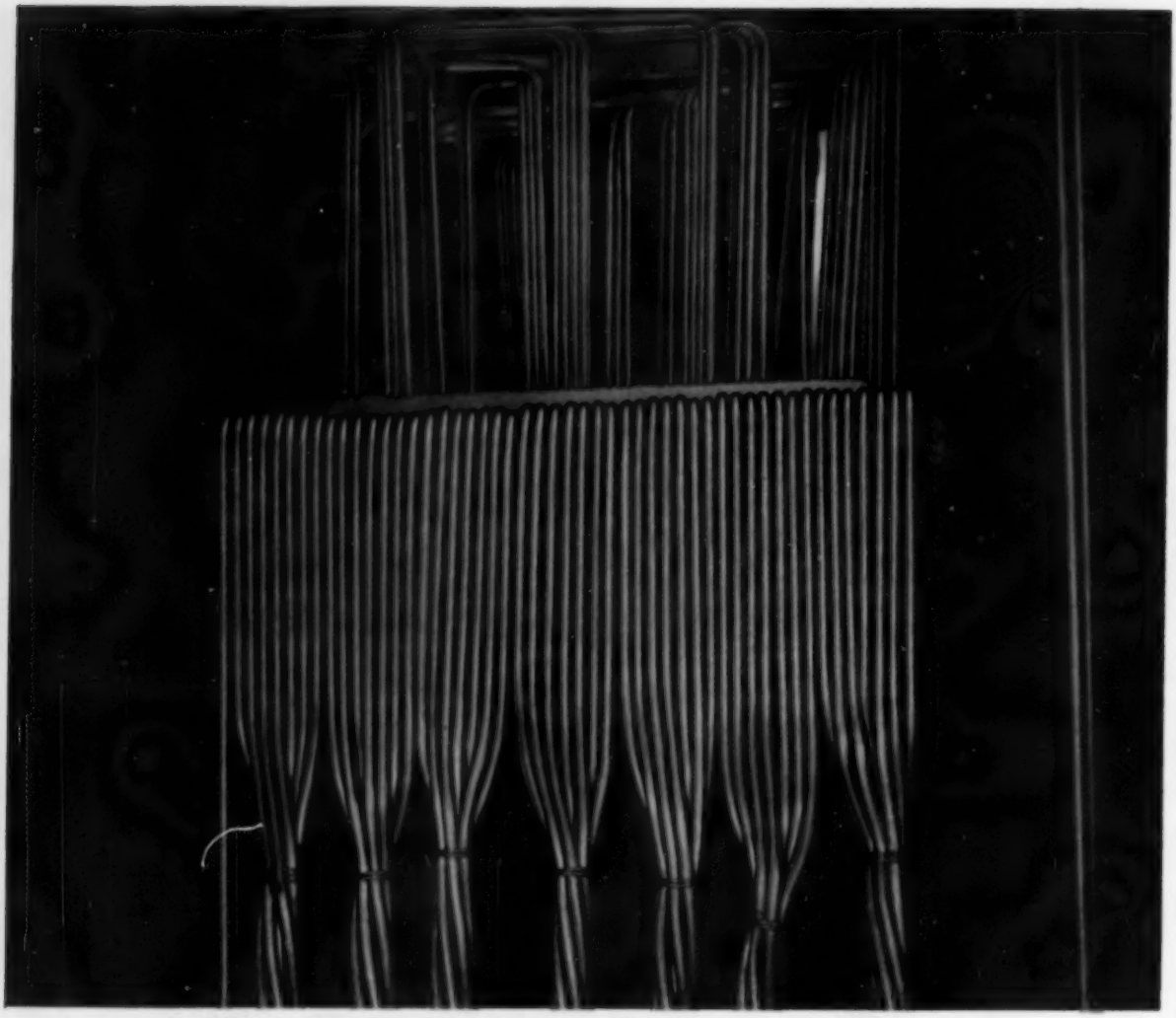
Warehouse Steel Products

Representative prices, cents per pound subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston, San Francisco and Los Angeles, 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††‡		Carbon	Floor
Atlanta	6.79	7.75	8.37	43.43	7.05	...	6.92	8.89	....	7.08	7.09	8.83
Baltimore	6.62	7.51	7.79	....	6.69	...	6.68	8.02[c]	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.57	45.28[c]	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.84	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.75	7.85	11.85	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	....
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73[3]	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	....	....	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[3]	6.96	8.80	6.74	7.86[3]	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.62	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64[3]	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	7.70	9.10	9.60	51.65	7.95	...	7.50	10.20	13.50	7.65	7.55	9.60
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65[3]	10.15	....	7.80	...	7.80	10.65[4]	14.55	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.06	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **⅜-in. and heavier; ††as annealed; ‡‡under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 999 lb and in Los Angeles, 6000 lb and over; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—600 to 9999 lb; [4]—4000 lb and over; [c]—1000 to 1999 lb; [e]—1000 lb and over; [f]—1500 to 3999 lb; [g]—2000 to 3999 lb; [h]—f.o.b. local delivery in lots of 10,000 lb and over.



Cabled copper instrument tubing installed at Appalachian Electric Power Company's Kanawha River Station. You see it at the point where the cable divides for run-outs to instruments. Note smooth, short-radius bends.

108,000 feet of cabled copper instrument-control tubing helps keep Kanawha River Power Station humming

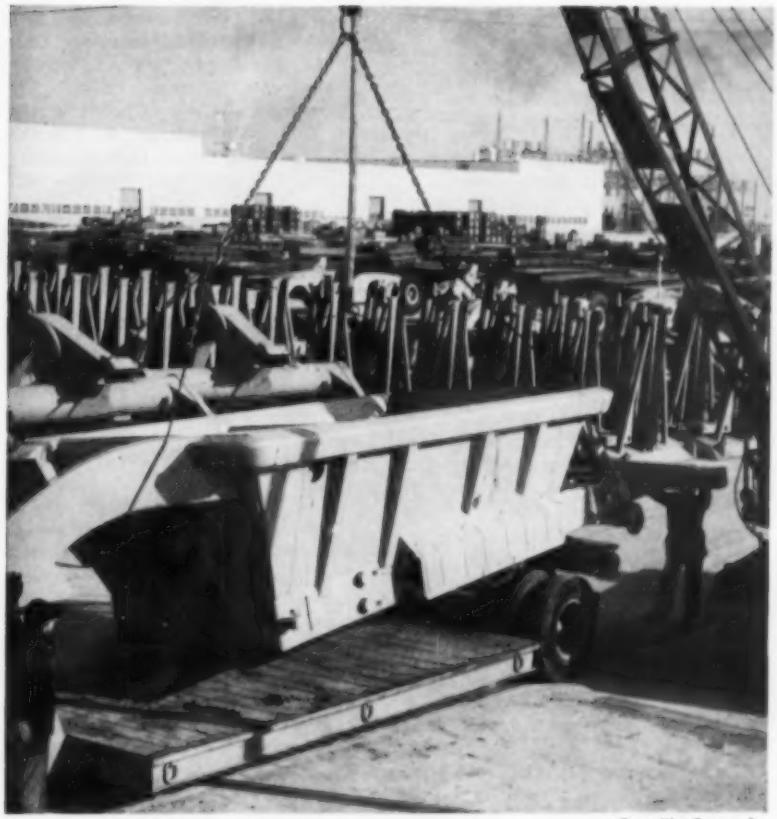
Hundreds of air-actuated instruments are an important part of the instrumentation control network at the 430,000-kw Kanawha River Station of the Appalachian Electric Power Company – part of the American Gas and Electric System. The size of the plant called for instrument tubing runs of up to 1,000 feet – with tubing cabled in bundles. For economical stranding, the tubing was needed in unusual lengths – without joints. To conserve space, small diameter tubing was needed. And ability to take short-radius bends without pinching was necessary.

The 108,000 feet of Anaconda Seamless Copper Tubing was supplied in 1,000-feet lengths. Outside diameter was only ¼-inch, wall thickness only .030". Shown above are typical tube bundles as they near terminal connections.

Anaconda small-bore, thin-wall tubing is available in lengths up to 2,400 feet. It comes in long coils on reels, or cut to your requirements. Capillary tubes, restrictor tubes, Bourdon tubes, special shapes, and fabricated tubes and parts for refrigeration and air-conditioning are available in many different alloys. These include phosphorized and OFHC copper, the full range of brasses, 3,003 aluminum, nickel silvers, and certain special alloys. For more information about Anaconda small-bore tubes and special shapes ask any district sales office, or write direct to *The American Brass Company, Waterbury 20, Connecticut.* In Canada: *Anaconda American Brass Ltd., New Toronto, Ontario.*

Some of the many sizes and shapes of Anaconda Small-diameter Tubes.

ANACONDA®
SMALL DIAMETER TUBES



Caterpillar Tractor Co.

More roadbuilding and demand for bigger payloads mean...

High-Strength Steels Gain Sales

"SALES HAVE INCREASED considerably in high-strength steel since the start of the 1955 roadbuilding season," report sales officials of U. S. Steel Corp., Pittsburgh.

Highway construction equipment makers are using increasing amounts of the material to build lighter, stronger products for off-the-highway work—a trend which has been accelerating since 1946.

Two Methods—With the tremendous increase in roadbuilding this year and the outlook even brighter for years to come, contractors want every possible pound of payload. Manufacturers point to two ways to do it:

First, if carbon steel is used, weight-bearing parts can be made more massive. This increases overall weight of the machinery and reduces its maneuverability.

Second, design for lightweight high-strength steel. Strength of the stressed members is doubled or tripled without increasing weight. Maneuverability is not impaired.

To Each His Own—Where payload is measured in the amount of material pushed or pulled, say a scraper, the heavier steel may be needed. Where weight carried is important, as in power shovel buckets, high-strength steel is most useful. In practically all off-the-road equipment, the lighter material has many advantages.

The initial cost of the alloyed steel is higher, but this can be more than offset, producers say. Where payload is increased, the equipment can do more work than its carbon steel counterpart in the same time. Maintenance is cut because of the corrosion resistance of the high-strength steel and its resistance to abrasion. Replacement and repair bills are reduced. The horsepower-to-weight ratio is better, and fuel consumption is less in the lighter equipment.

The lighter steel often makes possible the manufacture of a better balanced piece of equipment. When carbon steel is used to increase the capacity of equipment, it often results in a nose-heavy machine.

Better Teeth—Equipment makers have been working out ways to take advantage of the lighter-weight steel for years. They use mostly heavy gage hot-rolled sheet and plate. They don't use cold-rolled material because they require thicker gages, and surface finish is not of prime importance in most applications. Most common applications are weight-bearing and "biting" parts, such as the teeth of a bucket and the edge of a scraper.

One large midwest producer of tractors is coming out this fall with its own line of accessory equipment, including scrapers and graders, which is designed to take full advantage of the lightness and strength of high-strength steel.

Significance—What this means to steel producers is best summed up by an Inland Steel Co. sales executive: "The big increase in sales of the so-called high-strength steels to manufacturers of this equipment will come not so much from new uses in the machinery as from greater unit production in response to the increased demands of the roadbuilding program."

These demands will be great. It is estimated that over the next ten years, $3.5 billion worth of new roadbuilding equipment will be needed. In addition, about $1 billion worth of replacement machinery each year will be required.

Manufacturers of off-the-road equipment, already one of the largest customers, will be taking an even bigger bite of high-strength steels.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 110 & 130

The smaller auto builders have deferred sheet receipts from July to August, but this move hasn't weighed sufficiently in the market to provide much relief to the overbooked sheet mills. At the same time, while the larger automotive firms are not chewing up steel so fast as they are getting it in, their inventories are described as low.

Prospects of a price increase next month, following a hike in steelworkers' wages, are prompting consumers to press for maximum deliveries against orders on mill books.

A little cold-rolled sheet tonnage can still be scheduled for third quarter shipment. Most mills, though, consider themselves out of the market for that period. The supply sit-

uation in hot-rolled sheets is almost as tight as that in cold-rolled, and in galvanized and electrical sheets no third quarter tonnage is left open whatsoever. While not formally on a quota system, some mills are telling customers how much tonnage they can allot in a given period.

Peaceful settlement of auto labor negotiations removed one threat to sustained production of sheets and strip. Supply conditions will tighten further over the summer, however, since production is certain to slow down to some extent because of vacation suspensions and hot weather. Shipments of some mills are now 10 to 25 days behind schedule.

Producers are in receipt of inquiries for fourth quarter but, as a general thing, they will not begin to enter tonnage on books formally until July 1, and then possibly only for October shipment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 118

Extremely strong demand prevails for reinforcing steel. In the Chicago market the situation is complicated by the fact producers are losing ground in their rolling schedules. Late shipment of material is holding up construction jobs under way and deferring the start of some new work.

Steel Bars . . .

Bar Prices, Page 118

The signing by Ford and General Motors of labor contracts bolstered demand for carbon and alloy bars from the automotive industry. Third quarter outlook for alloy bars is even better than predicted last month.

Consensus of producers is that the supply of carbon bars will be tight for at least two months. Cold-finishers complain of extended deliveries from the hot mills. Shipments promised for June are scheduled for July delivery. In some instances, deliveries are 45 days behind schedule. While carryovers of hot carbon bars at the end of June may average three weeks, at least some June tonnage will not be shipped until August.

Cold-finished carbon bar sellers also are quoting fourth quarter delivery, where it is necessary to order hot stock from the mills to meet specifications. On most specifications they can book late August and september business on the basis of the hot carbon material they will receive against old orders.

Precision Drawn Steel Co., Camden, N. J., cold-finished bar producer, is starting work on a warehouse, which will almost double its present storage facilities.

Tubular Goods . . .

Tubular Goods Prices, Page 122

Installation of a seamless pipe mill at Sault Ste. Marie, Ont., Canada, is reported planned by Mannesmann A.G., Dusseldorf, Germany, leading producer of seamless steel pipe in that country.

Merchant pipe demand is brisk, reflecting the high level of building construction. One leading producer is quoting delivery of six to seven weeks on black pipe and eight weeks on galvanized in the East.

A major producer of pipe in the Pittsburgh district reports buttweld sales are the best in 18 months.

The strong June sales are due partially to some stocking.

The cast iron pipe market continues seasonally active. Demand, however, is expected to taper off from here on.

Buying by utilities in the New England area is notably ahead of that a year ago. This is especially true of gas companies.

Superior Tube Co., Norristown, Pa., reduced prices on unalloyed titanium tubing in sizes ⅝-in. O.D. and under, effective June 20. The reductions range up to 40 per cent for smaller tubing sizes and apply to both seamless and welded and drawn grades, with the greatest reductions in effect on the latter. For example, welded and drawn tubing of ⅛-in. O.D. by .010-in. wall, has been reduced 40 per cent and ⅝-in. O.D. by .035-in. wall, 30 per cent. The reductions result from economies attending increased production and improved control of raw material qualities.

Plates . . .

Plate Prices, Page 118

No letup in demand for sheared plate is noted. This seems to be the experience of both mills and warehouse distributors. The latter claim their business would be better if they could get more tonnage from the mills with which to balance inventories.

Sellers look for some leveling off in demand this summer, but, as a general thing, they anticipate a substantial volume of business throughout the hot months. Oil storage tank work is providing especially heavy demand in the East.

Philadelphia district sellers report demand for sheared plates continues at high tide. Producers see little slackening in the third quarter. It will be due to vacations and hot weather, not lack of demand. Universal plate supply, however, is relatively easy in the area.

Two major sellers of heavy plates that find a substantial outlet in the Pittsburgh market are booked heavily for the third quarter and are taking no more orders for that period.

West coast producers do not expect the usual seasonal summer slump. They are booked up solidly through the third quarter.

Sun Shipbuilding & Dry Dock Co., Chester, Pa., is low bidder on the construction of a 499-ft ocean-going vehicle cargo ship for the Military Sea Transportation Service.

Tin Plate . . .

Tin Plate Prices, Page 120

Most consumers expect no severe slowdown in production, but there's enough doubt regarding summer steel mill activity to raise shipments of tin plate this month. Consumers are building inventories of more than one month's supply.

Wire . . .

Wire Prices, Pages 120 & 121

Wire mills in the Midwest, notably in the St. Louis area, are experiencing a solid swell in demand, particularly from the Southwest where a number of new fabricating plants have been established.

Production of wire and cable at General Electric Co.'s Oakland, Calif., plant is running 50 per cent ahead of last year's.

Wire shipments this month are heavy in New England. More consumers than usual are taking tonnage before vacation suspensions.

Chicago district wire mills are pushing production in an effort to keep up with demand for merchant and manufacturers products. Consuming requirements for July and August appear just as strong as they were in May and June.

Pig Iron . . .

Pig Iron Prices, Page 123

The dip in pig iron shipments this summer isn't going to be as large as expected. Orders for castings are being received at a better rate, providing an expanding backlog. Because of this business, some shops are foregoing vacation shutdowns. Others will suspend operations for only one week instead of two.

Part of the June activity is attributed to anticipation by consumers of higher pig iron prices in July as a result of steel wage negotiations.

In the New York district, gray

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WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS

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When we first offered the BRAD FOOTE Hob List about a year ago the response was tremendous. Thousands of gear designers and engineers recognized in this catalog an opportunity to substantially cut their gear costs. And now, a new revised issue makes possible even greater savings.

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Bishop 2-1070 • OLympic 2-7700 • TWX: CIC-2856-U

subsidiaries

AMERICAN GEAR & MFG. CO.
Phone: Lemont 920
Lemont, Illinois

PITTSBURGH GEAR COMPANY
Phone: SPaulding 1-4600
Pittsburgh 25, Pennsylvania

iron foundries have been under increasing pressure, as castings consumers request a stepping up of shipments before foundries close for mass vacations.

Blast Furnaces Set Record

Blast furnace production set a monthly record in May, reports the American Iron & Steel Institute. Output of pig iron and ferroalloys totaled 6,804,935 net tons, which was 127,574 tons greater than in the previous record month, March, 1953. Of total output for the month, 6,753,236 tons were pig iron and 51,699 ferroalloys.

Cumulative production in the first five months was 30,940,547 tons, of which 30 673,656 tons were pig iron and 266,891 tons, ferroalloys.

Iron Ore . . .

Iron Ore Prices, Page 130

The first 3-million-ton cargo week of the 1955 lake shipping season was reported by shippers in the seven-day period ended June 20. Movement was 3,008,620 gross tons, according to the Lake Superior Iron Ore Association. This compares with 2,-423,694 tons in the like week of the 1954 season.

Lake Superior iron ore consumed in May totaled 7,797,744 gross tons, an increase of 507,278 tons compared with consumption in April and a gain of 2,421,996 tons over use in May a year ago. Cumulative consumption this year to the end of May was 35,636,090 tons, reports the Lake Superior Iron Ore Association. Consumption in the like period of 1954 was 29,376,625 tons.

Stocks of ore at lower lake docks and furnaces on June 1 amounted to 21,900,527 tons. This compares with 18,907,200 on May 1 and with 29,562,403 on June 1 last year.

Warehouse . . .

Warehouse Prices, Page 123

Distributors in most districts are ending June with a late flurry of sales. "Everyone's trying to build an inventory before the end of labor negotiations," one warehouse sales manager explains. Several in the Pittsburgh district added to their shipping forces to speed deliveries and satisfy the strong June demand for steel.

Sales will decline slightly in July, most trade sources say. Vacations at small fabricating plants hit a peak in the week of July 4.

On the West Coast, demand continues strong for most products. Sales for this first half of 1955 were

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Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$31.50-$32.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

66-60%	$3.25-$3.80
60%	4.15-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.65.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $160.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $256; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.80; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5¼	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40,35	110	9.50
40	100	9.50

5 to 10 per cent higher than for the like 1954 period. Distributors anticipate an active second half.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 130

Demand for foundry coke is improved. June and July shipments will be off from May volume because of vacations, however. The drop will be moderate, though.

Structural Shapes . . .

Structural Shape Prices, Page 118

Mill deliveries of structurals are getting tighter, especially the larger sizes of wide flange beams. Demand for the latter is running as heavy as at any time in recent years. One eastern fabricator says scheduled June tonnage will not be delivered him until August.

In general, supplies of structurals probably will grow tighter over coming weeks with highway and bridge construction at peak and mill operations subject to vacation shutdowns.

Wide-flange beams and heavy structurals are shipped about three months from the time of ordering in the New England market. The leading producer requires placement 30 days before scheduled rolling.

Rails, Cars . . .

Track Material Prices, Page 131

Freight car buying is picking up. The New York Central is inquiring for 3000 fifty-ton box cars, half of them 40 ft 6 in. in length, the remainder, 56 ft 6 in. The Southern Railroad is expected to close shortly on 1500 hoppers, and there is a rumor that the Pennsylvania is considering the purchase of 10,000 freight cars.

Awards are more numerous, the largest involving 905 freight cars for the Chicago & Northwestern.

The American Railway Car Institute and the Association of American Railroads report that for the second successive month orders for new freight cars increased. The May total was 3041 units against 2706 in April. Orders in May a year ago were only 1071 cars. Of the orders placed in May this year, 2168 went to the car builders and 873 to railroad shops.

An even greater increase in deliveries of new freight cars was reported for May. The total was 4083, against 2750 in April and 3173 in May, 1954.

Car order backlogs fell from 17,930 on May 1 to 16,886 on June 1. On June 1 a year ago the backlog stood at 15,615.

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $193 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%), Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 35-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 34.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy, ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primes and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.30% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 84c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.23 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.55c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighting approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb on Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ¼ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered, Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 5% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5.7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-8 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.ob. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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2. LOWER TOOL COST
3. MILLED FINISH
4. BURRLESS ENDS
5. NEGLIGIBLE WASTE
6. PERFECT PARALLELISM
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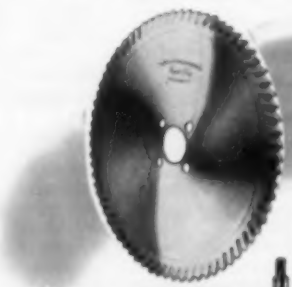

Material — 5" dia. SAE 1020

Cutting time — 54 seconds

Tool cost per piece — $ .019

IMPORTANT: Re-sharpening costs and all other tool costs are included.

ALWAYS—*it's your cost per cut that counts.* To determine that cost, all seven yardsticks listed above must be applied. You must increase usable production, get uniform accuracy, and reduce sawing costs. The Motch & Merryweather Triple-Chip Method out-performs and out-saves all others in the sawing of metal. Let us convince you.

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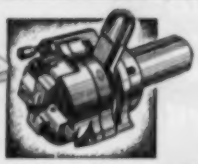

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Scrap . . .

Scrap Prices, Page 136

Philadelphia—Prices on steel scrap are stronger. No. 1 heavy melting, No. 1 bundles and No. 1 busheling have advanced to a spread of $37-$37.50, delivered, and No. 2 heavy melting to $33, delivered. Prices on No. 2 bundles are stronger at $28. This price may give way shortly to a still higher level. Some brokers are paying $28 to cover on tonnage originally booked at that price.

Cleveland — Reflecting generally improved sentiment in the market, steelmaking and blast furnace grades of scrap are quoted $1 higher although substantial sales are lacking. The flow of scrap to yards has slowed down, reflecting wildcat strikes at automotive plants in recent weeks. Summer vacation suspensions at manufacturing plants beginning early in July will reduce the scrap supply further. The higher prices not only reflect this but also expected high steelmaking and foundry operations most of third quarter.

Pittsburgh—Last mill purchases of No. 1 heavy melting scrap were for $35 a ton. There's a shortage at that price locally, and brokers are offering $35.50 to fill orders. Large consumers don't need to bolster their inventories. Owing to a scarcity of scrap at prevailing prices, dealers predict a price rise when mills place next month's orders.

Boston—Buying is light and steel scrap prices are for the most part unchanged. The downtrend, with the possible exception of export grades, appears to have been halted. The best price for No. 1 heavy melting steel is paid by the Worcester consumer, $29 within a $5 freight range. Eastern Pennsylvania is paying $2 less, shipping point. High nickel stainless scrap is sizzling, $245-$250 per ton being paid for the 18-8 grade, producer's plant.

New York—While prices on the prime grades of open hearth steel scrap are unchanged, brokers have advanced their buying prices on No. 2 heavy melting to $27-$28, and on No. 2 bundles to $22-$23. They also have increased offers for machine shop turnings to $13-$14; mixed borings and short turnings to $15-$16; and short shovel turnings to $17-$18. Other grades, including cast, are steady.

Buffalo—While new developments in the trade are awaited, scrap prices continue to mark time. Dealers are awaiting re-entry of the mills as active buyers. Huge stocks in millyards, however, and water receipts provide bearish factors at present. The cast iron market is slightly easier with prices off $1 a ton.

Cincinnati — The market is unchanged, but there is an undercurrent of strength. Brokers believe prices will go higher in July.

Chicago—Higher scrap prices appear in the making here. On several items, notably No. 2 heavy melting steel, No. 1 dealer heavy melting and No. 1 dealer bundles, brokers are paying dealers prices that prevailed in the last mill purchases of those grades. This is an advance of $1 a ton.

Detroit—Scrap prices are unchanged here, with the market on an even keel.

St. Louis — Mills are increasing their demands for scrap, with shipments to the district slowed by rains and plant production of scrap easing with the vacation season. Higher prices are anticipated in the wake of the recent increase at Chicago.

Birmingham—The scrap market is in vacation doldrums. Consumers have 45-to-60-day-inventories and are buying sparingly. The largest district mill is holding up shipments, but an Atlanta mill entered the market for limited tonnage at unchanged

(*Please turn to page* 138)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 22	$35.25
June 15	35.00
May Avg.	34.87
June 1954	27.92
June 1950	39.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	31.00-32.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	20.50-21.50
Mixed borings, turnings	20.50-21.50
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals, 5 ft lengths	37.00-38.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 3 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	45.00-46.00
Railroad specialties	43.00-44.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-240.00
18-8 turnings	110.00-115.00
430 bundles & solids	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*22.00-23.00*
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	*39.00-40.00*
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	43.00-44.00
Heavy breakable cast	33.00-34.00
Unstripped motor blocks	25.00-26.00
Brake shoes	*33.00-34.00*
Clean auto cast	44.00-45.00
Burnt cast	*33.00-34.00*
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
R.R. malleable	*46.00-45.00*
Rails, 3 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	44.00-45.00
Cast steel	39.00-40.00
Railroad specialties	*40.00-41.00*
Uncut tires	43.00-44.00
Angles, splice bars	45.00-46.00
Rails, rerolling	*51.00-54.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	200.00-210.00
18-8 turnings	100.00-110.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*17.00-18.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Low phos.	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*

CHICAGO

No. 1 heavy melting	33.00-35.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-35.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	33.00-34.00
Unstripped motor blocks	29.00-30.00
Clean auto cast	45.00-46.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Angles, splice bars	43.00-44.00
Rails, rerolling	51.00-52.00

Stainless Steel Scrap

18-8 bundles & solids	*240.00-250.00*
18-8 turnings	*120.00-130.00*
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended June 22)

	No. 1 Heavy Melting		
	High	Low	Close
Oct.	36.00	36.00	36.00*
Jan.			

Sales (160-ton units): 1 October.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.50
No. 2 heavy melting	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	15.00-16.00
Short shovel turnings	*24.00-25.00*
Machine shop turnings	*18.00-19.00*
Electric furnace bundles	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2 ft and under	*44.00-45.00*
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths	40.00-41.00
Angles, splice bars	43.00-44.00
Std. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	*37.00-37.50*
No. 2 heavy melting	*33.00*
No. 1 bundles	*37.00-37.50*
No. 2 bundles	*28.00*
No. 1 busheling	*37.00-37.50*
Electric furnace bundles	38.50
Machine shop turnings	*22.00*
Mixed borings, turnings	*22.00*
Short shovel turnings	24.00-25.00
Structurals & plate	39.50-41.00
Heavy turnings	33.50-34.00
Couplers, springs, wheels	40.50
Rails crops, 2 ft & under	50.00-51.00

Cast Iron Grades

No. 1 cupola	36.00
Malleable	45.00
Heavy breakable cast	41.00
Drop broken machinery	44.00-45.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	30.00-31.00
No. 2 bundles	*22.00-23.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, short turnings	*15.00-16.00*
Short shovel turnings	*17.00-18.00*
Low phos. (structural & plate)	33.00-34.00

Cast Iron Grades

No. 1 cupola	31.00-32.00
Unstripped motor blocks	21.00-22.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	235.00-240.00
18-8 borings, turnings	105.00-110.00
430 sheets, clips, solids	95.00-100.00
410 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.00-29.00*
No. 2 heavy melting	19.00-20.00
No. 1 bundles	26.00-27.00
No. 2 bundles	18.00-19.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	15.00-15.50
Short shovel turnings	16.00-16.50
No. 1 cast	31.00-32.00
Mixed cupola cast	29.00-30.00
No. 1 machinery cast	34.00-35.00

BUFFALO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	29.00-30.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*36.00-37.00*
No. 1 machinery	*41.00-42.00*

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	31.00-32.00
No. 2 bundles	21.00-22.00
No. 1 busheling	31.00-32.00
Machine shop turnings	17.50-18.50
Mixed borings, turnings	17.50-18.50
Short shovel turnings	21.00-22.00
Cast iron borings	17.50-18.50
Low phos., 18 in.	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast	35.00
Charging box cast	38.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.50-32.50
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.50
Machine shop turnings	15.00
Short shovel turnings	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	35.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	32.00
Clean auto cast	43.00
Stove plate	38.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.50
Rails, 18 in. and under	46.00
Rails, random lengths	40.00
Rails, rerolling	*51.00*
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	38.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-26.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap

(Delivered consumer's plant)

Rails, random lengths	34.00

LOS ANGELES

No. 1 heavy melting	*30.00*
No. 2 heavy melting	*28.00*
No. 1 bundles	*29.00*
No. 2 bundles	*23.00*
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 1 busheling	30.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	12.00
Cast iron borings	12.00
Cut structurals	30.00
Heavy turnings	11.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	26.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING

The Crown Tube Works, England, founded by James Russell, where Whitehouse was employed in 1825 . . . this is the eighth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.

1825 – The Invention of Wrought Iron Tube

Cornelius Whitehouse

Art research, courtesy A. F. Nuttle, Borough Librarian, Wednesfield, Staffs.

Until Cornelius Whitehouse succeeded in forming a commercially perfect tube, "the manufacture and use of coal gas simply hung fire."

The old process, which consisted of heating the plate and welding with the use of a mandrel produced tubes only 4 feet long. The method was costly and tedious.

Whitehouse's plan was to draw the skelp, uniformly heated to the proper temperature, through a hollow bell-shaped metal die. This made the tubes longer and of a more convenient length. He followed this by inventing machinery to straighten, bend and prove his tube as well as a solution for jointing.

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(*Concluded from page* 135)

prices. Electric furnace grades are moving better than others.

Los Angeles — With demand for steelmaking scrap at a peak for this year, prices on most grades have firmed. No. 1 heavy melting is up $2 to $30; No. 2 heavy melting, $4 to $28; No. 1 bundles, $2 to $29; and No. 2 bundles, $1 to $23.

San Francisco—The market here is strong. Bolstering influences: Sustained heavy export demand and the high operating rates at district steel mills.

Seattle — Scrap prices are unchanged, but recent heavy receipts may bring a price recession next month. Buyers are paying $33 and $29, respectively, for No. 1 and No. 2 heavy melting steel.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7150 tons, contract G-4, New Jersey approach work, Gloucester-Philadelphia bridge, awarded by Delaware River Port Authority to New York Shipbuilding Corp., Camden, N. J.

4670 tons, R. H. Macy & Co. shopping center, Garden State Plaza, Paramus, N. J., to American Bridge Division, U. S. Steel Corp., Pittsburgh; further substantial tonnage for this project may be awarded later.

4500 tons, office building, 425 Park Ave., New York, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1865 tons, bridges and viaduct structurals, Somerville, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh; A. V. Taurasi & Co. Inc., Somerville, general contractor; also 755 tons of reinforcing.

1800 tons, hangar and fieldhouse, Elmendorf and Ladd Air Bases, Alaska, to Isaacson Iron Works, Seattle; Islands Construction Co., Anderson, Benson, Moutin Corp., joint general contractors, low to U. S. Engineer at $3,422,026 and $2,837,320, respectively.

1760 tons, bridges, Massachusetts turnpike, Ludlow-Chicopee, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Bayer & Mingolla Construction Co., Worcester, Mass., general contractor; also 1320 tons of reinforcing.

1520 tons, building, Harlem hospital, New York, through Peaty & Furman, general contractor, to Allied Steel Products Co.

1000 tons, Ardmore, Pa., branch, Snellenberg department store, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

990 tons, section, state turnpike, Chicopee, Mass., through L. G. DeFelice & Sons, general contractor, to the Harmon Steel Co., Holyoke, Mass.

890 tons, state turnpike bridge, section 36-G, Carbon county, Pa., through Central Pennsylvania Quarry & Stripping Co., Hazelton, Pa., general contractor, to Lehigh Structural Steel Co., Allentown, Pa.

790 tons, 19-story apartment, 200 E. 36th St. Corp., Third Ave. and 36th St., New York, to Grand Iron Works, the Bronx, New York.

715 tons, warehouse, Starr Corrugating Co., Maspeth, N. Y., through the Gotham Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

515 tons, three-story office building, American Telephone & Telegraph Co., 50 Varick St., New York, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

500 tons, estimated, state office building, Richmond, Va., to Liphart Steel Co., Richmond; Virginia Engineering Co. Inc., Newport News, Va., general contractor.

335 tons, Millside Elementary School, Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.

300 tons, D. C. Capacitor Co., Irmo, S. C., to Kline Iron & Metals Co., Columbia, S. C.

285 tons, state brdige over Maine Central railroad, Winthrop, Me., to Bancroft & Martin

Rolling Mills Co., South Portland, Me.; H. E. Sargent Inc., Stillwater, Me., general contractor.

280 tons, state bridge, York county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, power plant, state hospital, Wards Island, New York, through Five Boro Construction Co., to Central Iron Works, New York.

185 tons, transmission towers, American Gas & Electric Service Co., Marion, Ind., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

180 tons, three bridges, Ansonia and Derby, Conn., through Jarvis Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, Gulf St. bridge, Milford, Conn., through Mariani Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, dormitory, weather station, Mt. Washington, N. H., to Groisser & Shlager Iron Works, Somerville, Mass.; Henry S. Wile Co., Newton, Mass., general contractor; reinforcing to Bancroft & Martin Rolling Mills Co., South Portland, Me.

STRUCTURAL STEEL PENDING

1760 tons, bridges, Massachusetts turnpike, Ludlow-Chicopee, Mass.; Bayer & Mingolla Construction Co., Worcester, Mass., low on general contract; also 1320 tons of reinforcing bars required.

1200 tons, junior high school, No. 62, Brooklyn, N. Y.; bids July 8.

1000 tons, Whidbey Island naval hangar, Washington state; bids in June 24.

350 tons, maintenance shop building, Mt. Rainier Ordnance Depot, near Tacoma, Wash.; Roy T. Earley Co., Tacoma, low.

750 tons or more, four hangars, Glasgow, Mont.; Fred H. Comb, Minneapolis, low at $1,317,834.

600 tons, Bent section, Patapsco tunnel, Baltimore, C. J. Langenfelder, Baltimore, low on general contract.

450 tons, grade separation work, route 119-G, Queens, N. Y.; Board of Transportation, New York; Horn Construction Co. is low on general contract.

350 tons, Monument St. bridge extension, Baltimore, for Pennsylvania Railroad; bids June 29.

300 tons, roof supports, etc., tunnel project, Canyon Ferry dam, Idaho; bids soon to the Bureau of Reclamation, Denver.

250 tons, Home for Aged, Brooklyn, N. Y.; bids closed June 17.

215 tons, three WF state bridges, Hartland, Westfield and Franklin, Vt.

200 tons, naval hangar, Klamath Falls, Oreg.; bids in.

175 tons, public school No. 272, Brooklyn, N. Y.; bids July 8.

REINFORCING BARS . . .

REINFORCING BARS PLACED

660 tons, power house switch and transformer yard, Buford Dam, Ga., to Atlantic Steel Co., Atlanta, Ga.; Ivey Bros. Construction Co. Inc., Atlanta, general contractor.

415 tons, office addition, Southern Bell Telephone & Telegraph Co., Louisville, Ky., to American Builders Co., Louisville; Whittenberg Construction Co., Louisville, general contractor.

370 tons, hangars and other structures, Elmendorf and Ladd Air Bases, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

250 tons, reinforcing and structurals, junior high school, Norwalk, Conn., to Fireproof Products Corp., New York, and County Iron Works, Port Chester, N. Y.; Thomas Reardon, Norwalk, Conn., general contractor.

185 tons, junior high school, Braintree, Mass., to U. S. Steel Supply Division, U. S. Steel Corp., Boston; James S. Kelliher Co., Quincy, Mass., general contractor; 70 tons, structurals, to Antonelli Iron Works, Quincy.

150 tons, electric furnace building, Northeastern Steel Corp., Bridgeport, Conn., to Fox Steel Co., Orange, Conn.; E. & F. Construction Co., Bridgeport, general contractor; fabricated structural steel to Berlin Construction Co., Berlin, Conn., direct by owner.

133 tons, airmen's dormitory, Great Falls, Mont., base, to Bethlehem Parific Coast

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Large Southern fabricator has openings for fabricated structural and/or plate estimators familiar with field erection costs. Preferably engineering graduates with two years practical experience. Forward resume with salary expected to:

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4' x 12' Model "D" Double Deck Simplicity Gyrating Screen with Double Ring Crusher. Top Deck ¾" openings, Bottom Deck Solid Pan, Side Discharge Lip for Top Deck, without motor or starter. Original Cost: $5,425.00 (purchased new but used only a short time).

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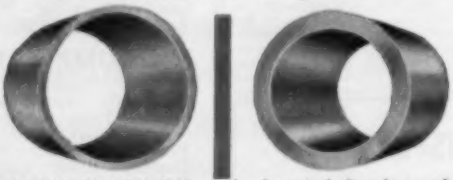
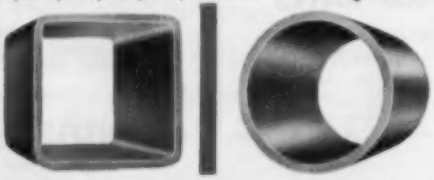


PIPE SIZES: ⅛" to 2" IPS Schedule 40

TYPES: 430, 302, 304, 309, 316, 321, 347; and others including low-carbon grades.

SHAPES: Squares, Rectangles and Special Shapes



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- WELDED CARBON STEEL MECHANICAL TUBING
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- EXCLUSIVE "RIGIDIZED" PATTERNS

Steel Corp., Seattle; Leigland & Son, Seattle, general contractor.

110 tons, state bridge over Maine Central railroad, Winthrop, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; H. E. Sargent Inc., Stillwater, Me., general contractor.

REINFORCING BARS PENDING

116 tons, Washington state box girder bridge, King county; bids to Olympia, Wash., July 5.

PLATES . . .

PLATES PENDING

355 tons, cone roof tank, Esso Standard Oil Co., Albany, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

PIPE . . .

CAST IRON PIPE PLACED

550 tons, 8 to 16 in., Springfield, Mass., to Warren Foundry Co., Everett, Mass.

440 tons, 6 to 10 in., Reading, Mass., to Warren Foundry Co., Everett, Mass.

325 tons, 6 and 12 in., Weymouth, Mass., to Warren Foundy Co., Everett, Mass.

225 tons, mostly 16 in., Newton, Mass., to Warren Foundry Co., Everett, Mass.

CAST IRON PIPE PENDING

1300 tons, 16 and 4 in., also 150 fire hydrants, Mercer Island, Seattle, District No. 93; Frank Coluccio, Seattle, low at $380,798; also bids for alternative type pipe.

STEEL PIPE PLACED

265 tons, 6400 feet of steel pipe, Public Service Electric & Gas Co., New Brunswick, N. J., to Wickwire Spencer Division, Colorado Fuel & Iron Corp., Claymont, Del.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Long Island, ten 1600-hp general-purpose diesel units, to Alco Products Inc., New York.

RAILROAD CARS PLACED

Ann Arbor, seven cabooses to the International Railway Car Co., Kenton, O.

Chicago-Great Northern, 15 covered hopper cars to General American Transportation Corp., Chicago.

Chicago & North Western, 905 freight cars to Pullman-Standard Car Mfg. Co., Chicago; 750 fifty-ton boxcars will be built at the Michigan City, Ind., plant and 155 seventy-ton covered hopper cars at the Butler, Pa. plant.

Chicago, Rock Island & Pacific, 98 seventy-ton covered hopper cars to the Pullman-Standard Car Mfg. Co., Chicago.

Detroit, Toledo & Ironton, 50 seventy-ton hopper cars to the Pullman-Standard Car Mfg. Co., Chicago.

Duluth, South Shore & Atlantic, one rail diesel car to the Budd Co., Philadelphia.

Florida East Coast, 35 seventy-ton covered hopper cars to the Pullman-Standard Car Mfg. Co., Chicago.

Minneapolis & St. Louis, 40 seventy-ton covered hopper cars to the Pullman-Standard Car Mfg. Co., Chicago.

Norfolk & Western, 50 seventy-ton covered hopper cars to Pullman-Standard Car Mfg. Co., Chicago.

North American Car Corp., 30 seventy-ton covered hopper cars to Pullman-Standard Car Mfg. Co., Chicago.

Northern Pacific, 20 seventy-ton covered hopper cars, to General American Transportation Corp., Chicago.

Railway Express Agency Inc., 200 railway refrigerator cars, to General American Transportation Corp., Chicago.

Santa Fe, 500 seventy-ton covered hopper cars to the Pullman-Standard Car Mfg. Co., Chicago.

St. Louis-Southwestern, 225 fifty-ton box cars to the Pullman-Standard Car Mfg. Co., Chicago.

Wabash, ten cabooses to the International Railway Car Co., Kenton, O.

RAILROAD CARS PENDING

New York Central, 3000 fifty-ton box cars; bids asked.

Southern, 1500 hopper cars.

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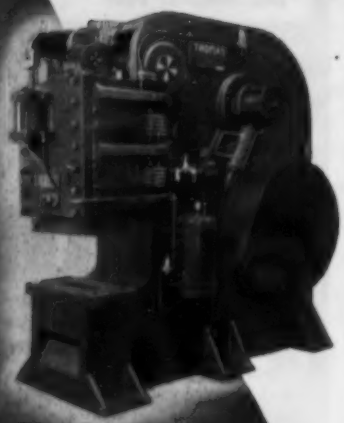
(4) Heavy-Duty Mill Type Plate Shear, capacity 1¼" by 6' stainless 120,000 psi



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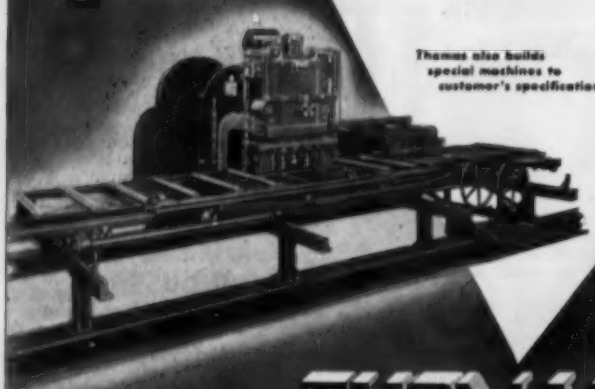
Thomas also builds special machines to customer's specifications



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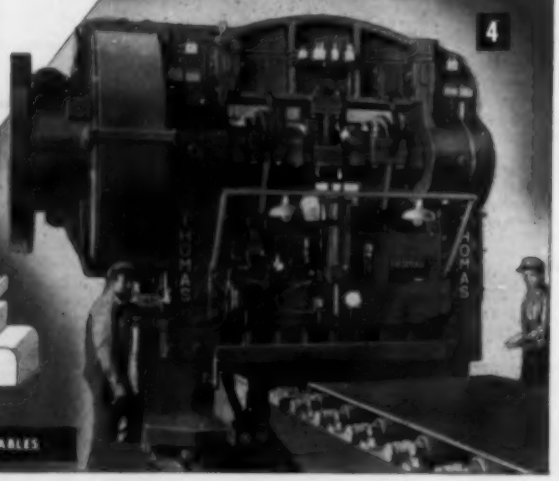

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MACHINE MANUFACTURING CO.

PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

Farval helps flying shear line cut steel processing costs

FARVAL—
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No. 170

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Get Free Bulletin

Farval representatives in all major industrial centers are ready to serve you. There's one near you. Write for free Bulletin 26 that tells you all about Farval, shows how Farval Centralized Lubrication pays for itself many times over. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

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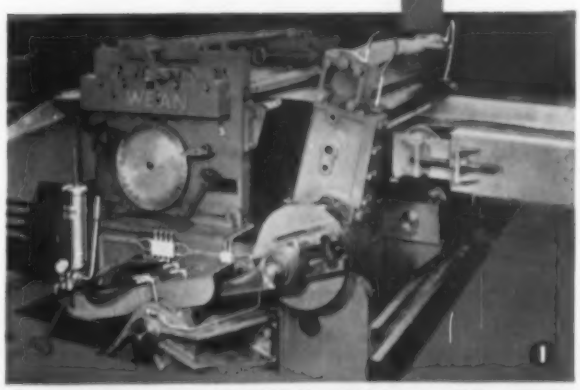
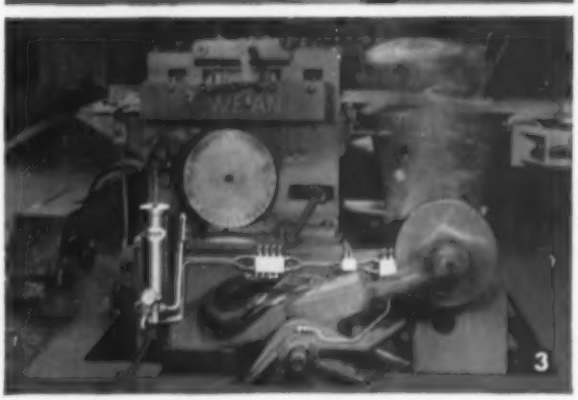
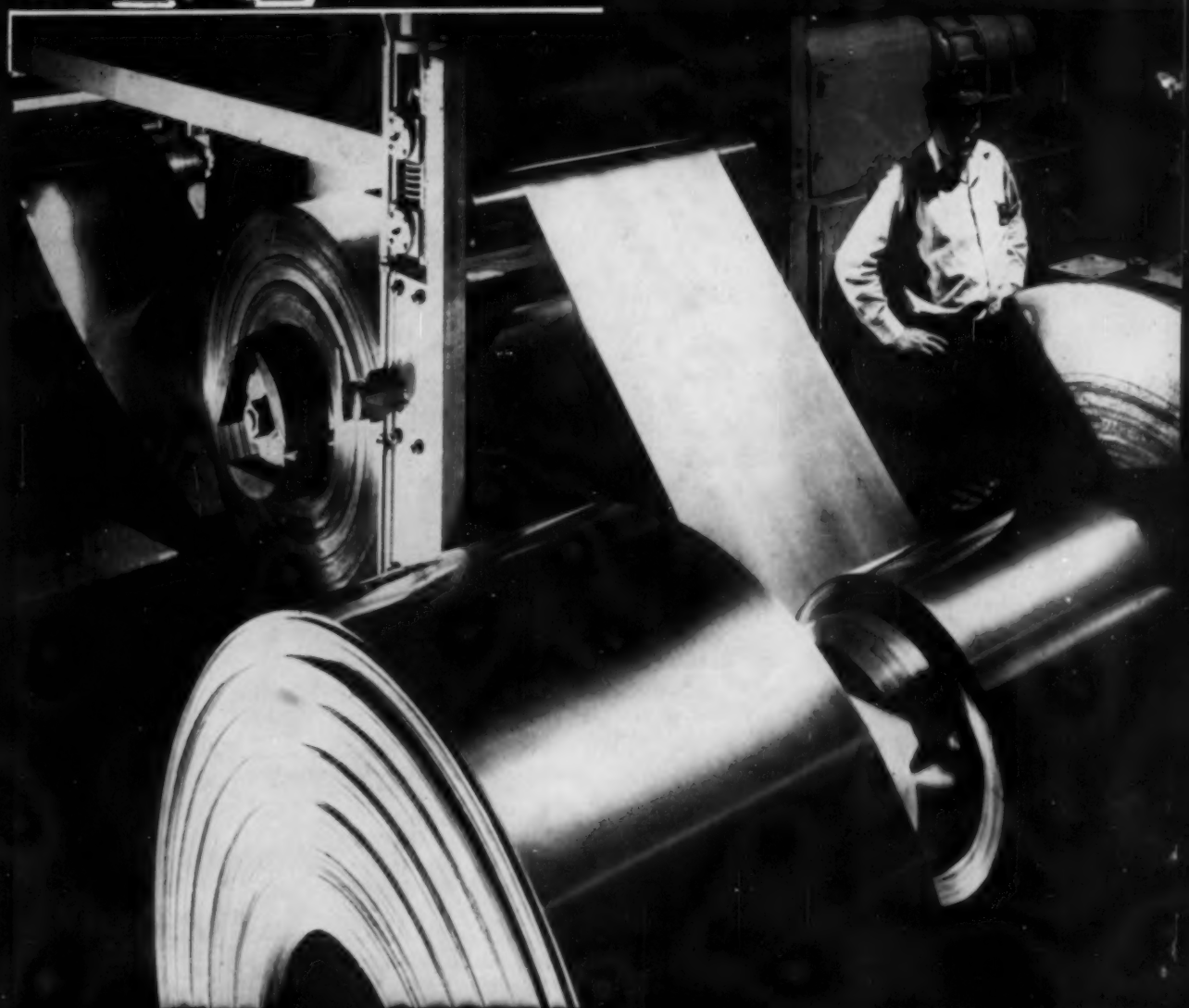




Wean Equipment Corporation Slitting and Flying Shear Line. Photo 1 shows machine in stationary position. Photos 2 and 3 taken while machine operating. Note intense vibration which the rugged Farval lines withstand.

KEYS TO ADEQUATE LUBRICATION — **Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.**

The MEAN Company, Inc.



SPECIALISTS IN SHEET, TIN and STRIP MILL EQUIPMENT